

WEEDS OF DEWEY-HUMBOLDT, ARIZONA  
SECOND EDITION

By  
Garry Rogers  
Humboldt, Arizona



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Publisher's Cataloging-in-Publication data

Names: Rogers, Garry F., 1946-, author.

Title: Weeds of Dewey-Humboldt , Arizona, Second Edition / by Garry Rogers.

Description: Includes bibliographical references and index. | Prescott, AZ: Coldwater Press, 2023.

Identifiers: ISBN 9798854313438 |

Library of Congress Control Number: 2023914449

Subjects: LCSH Weeds--Arizona. | Dewey-Humboldt (Ariz.) | Lonesome Valley (Ariz.) | BISAC NATURE / PLANTS / GENERAL

Classification: LCC SB612.A7 .R63 2023 | DDC 581.6/5/09791-dc23

Cover Image: Yellow Starthistle (*Centaurea solstitialis*)--ASTERACEAE (page 108).

Weeds of Dewey-Humboldt, Arizona

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## 1 INVASIVE WEEDS

Most weeds are beneficial. They can be a costly nuisance in yards, gardens, and farms, but for Earth's ecosystems their natural role has been to serve as emergency technicians, the first responders protecting the soil after fires, floods, and other damaging events. Only 10% of the weeds compete with and replace native plants. These invaders can drastically reduce habitat value for local plants and animals. They alter the soil microbiome, reduce fertility and even decrease resistance to further invasion.

Humans introduce most of the invasive weeds by accident. For centuries we have transported plants across the oceans, deserts, and jungles to places they couldn't have reached naturally and where they have no natural competitors or consumers. Everywhere, we help wind, water, birds, and animals spread weeds. Seeds attach to shoes and clothing, automobiles, livestock, and construction equipment and then drop off and begin to spread along trails, roads, and power transmission corridors. A colleague once analyzed the contents of a car wash's sediment traps and found viable seeds and roots of over 400 species (Bob Frenkel 1970).



**Fig. 2.1** Rabbitfootgrass (*Polypogon monspeliensis*) on a split rock in the Agua Fria River. This moisture-loving grass may have originated in Europe, but it became a global cosmopolitan so early in human history its origin is uncertain (photo © GR)

## 2 WEED ECOLOGY

Most weeds grow poorly in shade. Many can grow and reproduce in light shade, but only a few species like Shepherdspurse (*Capsella bursa-pastoris*) (page 126) can reproduce in deeper shade.

In Dewey-Humboldt (D-H) drought-tolerant weeds flourish in disturbed upland habitats, and moisture-dependent weeds grow in and around lawns and along the Agua Fria River (Fig. 2.1).

Weeds are tolerant of drought, but most can grow and produce seeds quickly when rain comes. Summer cypress (*Kochia scoparia*), for example, can produce seeds on a single three-centimeter spike. But when it rains, the same plants can grow to four meters and produce thousands of seeds.

During the normal course of events, large, mat-forming, shade-casting, long-lived species of the desert grasslands, shrublands, and woodlands spread back into disturbed sites and replace the weeds. The long-lived plants build complex nutrient cycles, and form interacting groups of species that maximize production from local minerals and climate. These mature communities are evolution's most advanced creations. Within them, the number of well-represented species, referred to as biodiversity, reaches maximum levels.

### 2.1. WEED DISPERSAL

Weeds are the best travelers of the plant world. Unlike apples, weed fruits often fall far from the tree. Seeds are the most common means of dispersal; however some weeds disperse using underground rhizomes, surface stolons, and vines. These plant organs can creep along with surprising speed, but none of these match the velocity achieved by the seeds of the weeds whose seedpods explode when they become dry. These botanical bombardiers propel their seeds surprising distances. The bursting seedpods of Creeping Woodsorrel (*Oxalis corniculata*), a tiny plant common on moist peripheries of lawns, fields, and streams, shoot seeds up to 10ft (Fig. 2.1.1).

**Fig. 2.1.1** Yellow flowers and shamrock-like leaves of Creeping Woodsorrel mixed with grass and Dandelions (photo © GR)



## 3 INTRODUCED WEEDS

Birds and wind can carry weed propagules long distances, but it was not until the 1500's when sailing ships carried passengers and cargo between the Old World and the New destructive weed invasions could happen. Thousands of species of weeds began and continue crossing the oceans mixed with grain and stowed away on ships and planes. After 500 years of constant human contribution to dispersal, the reservoirs of weedy colonists are not empty. New weeds are still crossing the oceans and entering ecosystems far from home.

Ships crossing between the Old and New world often dump ballast on land and at sea that contains weed propagules. Weeds also arrive mixed with grain and seeds of horticultural plants, stuck in the fur of livestock, the fabric of clothing, and in the treads of tires.

Most transcontinental weed dispersal has been from the Old World to the New. Weed scientists believe Eurasian weeds evolved more efficient traits than New World weeds because there is greater variety of environments and selective pressures across the larger Eurasian continent with its broad connection to Africa. The longer Old World history of human occupation and disturbance created opportunities for evolution of more advanced weed

abilities. For example, no North American weeds can match the overwhelming success of cheatgrass (*Bromus tectorum*), redstem filaree (*Erodium cicutarium*), red brome (*Bromus rubens*), and others that in various combinations have spread across the arid western U. S.

Though less frequent, New World weeds have dispersed to the Old. For example, Shao et al. (2019) report Lance-leaf Sage (*Salvia reflexa*) has several small colonies near a grain transfer site in northeast China. And there are records of the weed in Australia, Europe, New Zealand, and South Africa.



**Fig. 3.1** Dalmatian Toadflax (*Linaria dalmatica*) (photo © GR)

Horticulturalists and range scientists have imported plants for various purposes and discovered too late that the plants could spread and damage ecosystems far beyond the places of their introduction. For example, nurseries everywhere sell yellow-flowered Toadflax (*Linaria spp.*), beautiful plants of Eurasian origin (Fig. 2.2.1). The plant's roots delve deep and may send up shoots outside flowerbeds, in neighbor's yards, and across the road. Controlling Toadflax with regular pulling and mowing is easy in gardens and yards, but not so easy when it spreads across native shrublands and Weeds of Dewey-Humboldt, Arizona

woodlands. The plants have established their deep root systems across thousands of acres of arid vegetation in the region surrounding Dewey-Humboldt. Today, Dalmatian Toadflax has spread so far eradication would take an enormous investment. The later section on weed control discusses what it takes to get such an investment. Meanwhile, like an untreatable disease, this pretty flower continues spreading and robbing native plants of moisture and nutrients.

Lehman Lovegrass (*Eragrostis lehmanniana*) provides an example of a plant land managers imported for its utility but were surprised when the plant spread from the roadsides into native desert grasslands. Around 1930, Arizona land managers heard about an Old World plant that would feed livestock and would colonize and grow on land cows had stripped of other palatable plants. The managers imported seeds and planted them on overgrazed lands. Regional transportation engineers planted the grass on eroded roadsides. The grass grew well, and the cows were happy, and the roadsides stopped eroding. Soon, however, ecologists realized the plant was invasive. By 2010 when all planting in the region around Dewey-Humboldt stopped, the plant had replaced almost half a million acres of desert grassland. It had crowded out native grasses and formed pure stands with reduced plant and animal diversity.

Another imported invasive weed is Sweet Resinbush (*Euryops subcarnosus*). This little shrub has bright yellow flowers and a distinct odor some of us find offensive. Grazing managers with the U. S. Department of Agriculture planted this South African perennial in an experimental plot in Arizona in 1935 with the mistaken belief it was a desirable forage plant for cattle. Soon realizing cattle would not eat the stinky little bush, the investigators lost interest. Untended and forgotten, the plant persisted in the experimental plots until almost 30 years later it began to spread. Before weed scientists realized what was happening, the plant had invaded thousands of acres. At present, Sweet Resinbush is pushing north along roads, transmission corridors, and regional desert rivers. It will reach D-H soon. I think it will be easier to control than our worst smelly plant, Blue Mustard (*Chorispora tenella*), but prevention, discussed below, would preserve olfactory contentment of many of our residents.

There are examples of introductions with unexpected consequences to fill several books. The image below (Fig. 3.2) shows an example of an introduced species land managers planted (Crested Wheatgrass, *Agropyron cristatum*) being replaced by another introduced species (Cheatgrass, *Bromus tectorum*).

Accidental and intentional introductions of weeds like Lehman Lovegrass, Sweet Resinbush, and Crested Wheatgrass continue today. Ranchers still dream of finding a plant that protects the soil while producing a never-ending supply of abundant nutritious forage. They might sooner find they can use cold fusion to grow money on trees.



**Fig. 3.2** Cheatgrass vs. Crested Wheatgrass. I drove by this place many times admiring the dense Pinyon-Juniper (*Pinus edulis*, *Juniperus osteosperma*) woodland with its mid-level layer of chaparral shrubs, lower layer of Sagebrush (*Artemisia tridentata*), and its lowest layer of herbs and biological soil crust. Cattle trampling helped the Eurasian invader Cheatgrass (*Bromus tectorum*) spread into the woods and fuel a fire that killed the trees. Land managers planted Crested Wheatgrass across the area (green clumps in the foreground), but it is losing to Cheatgrass (reddish grass) (photo © GR)

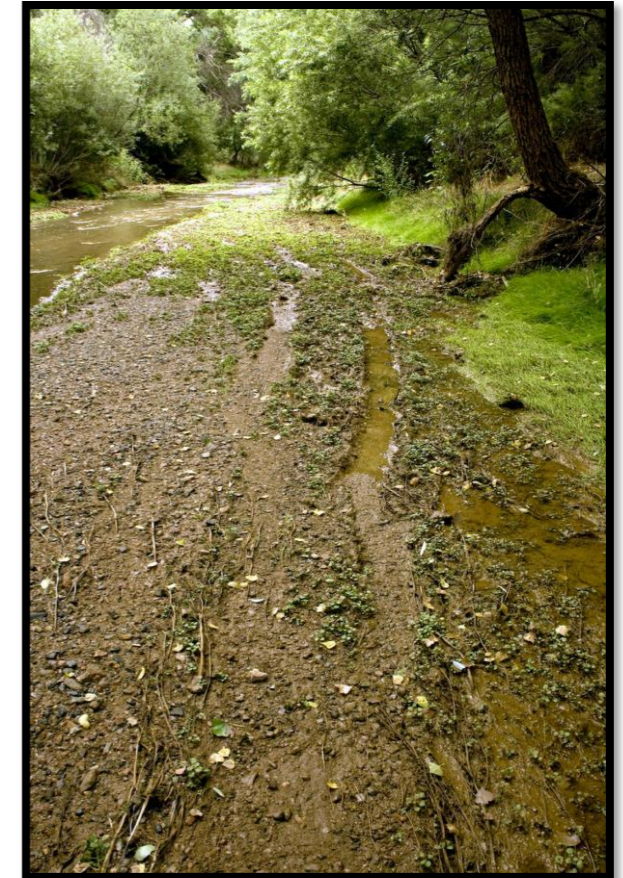
#### 4

### DISTURBANCE AND WEED ESTABLISHMENT

In most instances, weed germination occurs on disturbed sites, those places where weather, human activity, or seismic events have thinned or removed the vegetation. Some invasive weeds appear to invade undisturbed natural Weeds of Dewey-Humboldt, Arizona

vegetation but determining this is difficult. Human disturbances have affected every square inch of the world's deserts. There are sites where natural barriers or fences exclude livestock grazing, but the weedy land surrounding these sites can shower them with such a heavy rain of weed propagules weeds colonize tiny transient openings. These protected sites also serve as magnets for wildlife and suffer heavy use by small animals that pass through barriers.

**Fig. 4.1** Damaged streambank. Water diversions, livestock, human travel and settlement, and floods impact desert riparian habitats. The site in this photograph has high value despite the impacts because it is a perennial stream with a small willow-cottonwood riparian forest occupying the floodplain (photo © GR)



Before people arrived, natural disturbances were smaller and less frequent, and weeds were a small part of regional floras. Even after early immigrants reached the New World 40,000 years ago, disturbances were not as frequent or widespread as they became when Europeans arrived. The growth and spread of human civilization added many new disturbances and sites available for weed colonization. The principal disturbances are construction, farming, domestic livestock grazing, roads, and human-caused

fires. Droughts, storms, and floods arising from climate change. All are adding even more demands for nature's EMTs.

Some introduced weeds can spread into areas minimally disturbed. When we transport plants to new regions, we release them from the natural limitations of their homeland. We also expose them to new competitors, predators, and environments. The new conditions limit the growth and prevent the spread of most foreigners, but not all. Some of the weeds introduced to North America from Eurasia and Africa have spread across the land. Their more advanced competitive abilities developed in the larger, longer-human-disturbed lands let them absorb moisture and nutrients faster than native species, let them repel natives with toxic secretions, and let them fuel fires their seeds can survive. These latter species, which I call the fuelweeds, are the greatest of all threats to desert ecosystems.

In this time of extreme human impacts on nature, a time some are calling the Anthropocene era of Earth history, pre-disturbance vegetation rarely has time to replace the weeds before another disturbance occurs. In every desert region, we see places where taller, longer-lived plants are missing, where weeds have become the permanent vegetation.

## 5

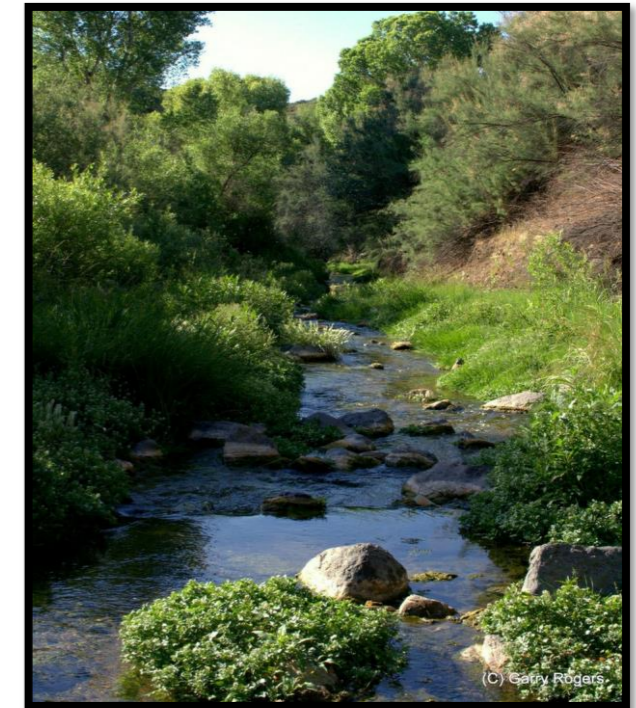
### DEWEY-HUMBOLDT HABITATS

Dewey-Humboldt lies in Lonesome Valley, an arid high-elevation place with hot summers and cold winters. Drought-tolerant trees, shrubs, and grasses dominate the valley floor and upland slopes. Phreatophytic trees and shrubs gather along the river and around ponds and springs. The valley lies between three of the North American deserts: The hot Sonoran Desert south, cool Mojave Desert west, and cold Great Basin Desert north. The weed flora of D-H combines elements of the three deserts and adjacent drylands but does not include species adapted to the hottest and coldest portions of the Sonoran and Great Basin Deserts.

When the Agua Fria River floods, the riparian vegetation bordering the stream slows water roaring down the main channel and spreads it across the flood plain, Despite the slowing, floods always rip up some plants and exposes roots of others. Weeds colonize these injuries and hold the soil in place.

Weeds of Dewey-Humboldt, Arizona

People removed the natural vegetation of the floor of Lonesome Valley long ago and planted irrigated crops and exotic pasture grasses. However, the stretch of the Agua Fria River running through town supports many native species and is a critical regional habitat. The open water supports amphibians, arthropods, birds, fish, lizards, mammals, snakes, and turtles. Hundreds of wildlife species spend all or part of their lives near the river. Yellow-billed Cuckoos and Southwest Willow Flycatchers, both on the U. S. Endangered Species List, nest beside the river. All the creatures living in the river or coming to it for water are components of Lonesome Valley's ecosystem, defined by food webs stretching from the river to the mountains and from the soil to air above the trees.



**Fig. 5.1** Agua Fria River. Willow (*Salix*) and Cottonwood (*Populus fremontii*) dominate the riparian phreatophytic vegetation. Many other species including many weed species line the river banks (photo © GR).

## 6

### DRAWINGS, PAINTINGS, AND PHOTOGRAPHS

Plant identification is easier with drawings made by an experienced botanical illustrator than with photographs. An illustrator can emphasize the essential features distinguishing species. However, photographs are an inexpensive means to show plant colors and scenes with mixed species.

Weeds of Dewey-Humboldt, Arizona

For each weed, I present the best graphic illustrations available. Many of the drawings are by Lucretia Breazeale Hamilton from the book *An Illustrated Guide to Arizona Weeds* by Kittie Parker (1972). I include them with the generous permission of the University of Arizona Press. Some of the photographs are by me and others have Creative-Commons licenses that allow reproduction with attribution to the photographer (CC BY 2-4 and BY-SA 2-4). I did not alter the photographs except as needed to fit them on the page and make them suitable for printing. Some of the drawings and photographs are from U. S. government web sites and are in the public domain. Paintings were available for some of the weeds. The ones I used are over 100 years old and are in the public domain. For all illustrations, I gave creator names in the captions and in an Index of Illustrators, Painters, and Photographers before the General Index.

You can find more works by the creators by entering their names or the names of the plants they depicted in the search box at Wikimedia Commons, Wikipedia, or Flickr Creative Commons. "GR" in a caption identifies photos by me. You can use my photos as long as you attribute them as "© Garry Rogers." Look up Creative Commons BY-SA 4.0 to read the license requirements.

## 7

### PLANT NAMES

Plant names often present a challenge. Common names for most species vary from place to place, and scientific names intended to simplify communication can themselves change. Botanists often change plant names to add variants, combine species, or even move a species to a different genus or family. However, common names are maddening. Even related publications such as the medicinal plant books by Charles Kane and his inspiration, Michael Moore, use different common names for the same species.

The scientific naming system assigns related genera to families, related families to orders, related orders to classes, and related classes to kingdoms. This book includes the species, genus, and family names. To keep similar weeds together, I grouped the species description pages by family and I alphabetized the families by their scientific names.

The common names of many plants are older than the scientific names. If you want to learn more about the origin and history of common names, you can get a quick start with the book by David Gledhill (2008). Most of the common names I use in this book are from *Arizona Weeds* by Kitty Parker. The Weed Science Society of America (<http://wssa.net>) has a comprehensive list weed scientists consider the standard for botanical common names. However, getting everyone to use the same common names for plants is as unlikely as getting Americans to replace yards with meters.

## 8

### WEED IDENTIFICATION

Drawings and photographs suffice to identify most species. For a few, however, measurements are helpful. You will need a 10x hand lens, a ruler, and a yardstick or retractable tape measure marked with standard (feet and inches) and metric (meters, centimeters, and millimeters) units.

#### 8.1 WEED SPECIES IN THIS BOOK

This book includes drawings, photographs, paintings, and descriptions for 135 species I've found growing in D-H and 19 species botanists have found nearby.

Many of the weed species found here originated in Eurasia, but some are from the other continents, and some are natives of the region surrounding D-H. A few North American natives have spread to other continents, and others could do so. Mesquite, a native shrubby tree of the Southwest, is an invasive species in Australia.

#### 8.2 PLANT DESCRIPTIONS

Each weed species has two pages. First pages have an illustration or photograph and a description with measurements for leaves, flowers, and seeds. Second pages have symbols indicating origin, prominent features, my perception of the weed, general remarks on the characteristics, distribution, and uses of the weeds, and additional pictures. The symbols appear in brackets following the plant name. For example, weeds whose dispersal mechanisms include sharp hooks or barbs receive a **P** (painful) and weeds difficult to eradicate receive a **T** (troublesome). A table showing the number of weeds having each of the symbols is given in the conclusion.

**A:** Annuals that sprout from seed.



**B:** Biennials sprout the first year from seed and the second year from roots.

**P:** Perennials sprout from roots or surviving aboveground root crowns and stems.

A vertical line | separates the letters above from the ones below.

**D:** Delightful weeds to ignore or encourage because they are attractive, fragrant, or desirable for other reasons. For example, you may want to plant Milkweeds because they are a preferred host of Monarch Butterfly caterpillars.

**E** = Edible plants according to various sources, but especially the books by Michael Moore (1989, 2003), Charles Kane (2017), Delena Tull (2013), and the website by Plants for a Future (2019).

**F** = Future. I have not seen these weeds in D-H, but they are present in in similar environments surrounding the farm.

**I** = Invasive. Some alien weeds can replace native vegetation and reduce the overall amount of wildlife food and cover. The worst of these get the letter **I**.

**M** = Medical plants according to the books by Michael Moore (1997, 2003), Charles Kane (2017), and others included in the Bibliography.

**N** = Native weeds in North American deserts before people crossed the oceans and introduced weeds from other continents.

**P** = Obnoxious weeds with painful or irritating seeds or thorns including those that stick in animal fur (and Blue Mustard, because of its foul odor).

**T** = Troublesome. These weeds have persistent seeds or roots that make them difficult to eradicate.

**Noxious weeds:** Many countries, states, and provinces have lists of restricted weeds. Arizona has a list with three categories: weed species to control (blast out of existence), species to quarantine whenever found, and species to block from entering the state. The third list has 54 species. However, it's like my Amazon wish list: Not possible under foreseeable budget limits. Most weed managers would agree all three lists are wish lists. Nevertheless, I marked the species occurring in D-H on the first two lists as Z-1 and Z-2. What we should do about them is unclear. Their presence throughout the state makes it unlikely we will control or quarantine them as called for by the state's regulations.

**Z-1** = Regulated pest in Arizona. This means the plant species, including viable plant parts (stolons, rhizomes, cuttings and seed, except seeds of agricultural and ornamental species), found within the state should be destroyed to prevent further infestation or contamination. Three D-H weeds are on this list

**Z-2** = Restricted pest in Arizona. This means the species, including viable plant parts (stolons, rhizomes, cuttings and seed, except agricultural and ornamental seed), found within the state shall be quarantined to prevent further infestation or contamination. Ten D-H weeds are on this list.

Weeds of Dewey-Humboldt, Arizona

## 9 FIELD GUIDE



### 9.1 AMARANTH FAMILY—AMARANTHACEAE

**Fig. 9.1.1** Wright Saltbush (*Atriplex wrightii*)—AMARANTHACEAE. Annual reproducing from seed. Erect stems 2-4ft high. **Leaves:** Silvery powder below, bright green above, edges wavy or toothed, alternate, 2-8cm long, 6-25mm wide. **Flowers:** Male flowers in 2-12in leafless spikes on stem tops; female flowers in small clusters in leaf axils. **Seeds:** Pale brown, 1mm wide, enclosed by pair of green or yellow fan-shaped bracts about 2mm wide with 3-7 short teeth across the top. **a.** Male flowers. **b.** Cluster of three fruits (Fig. 9.1.1 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

### Wright Saltbush (*Atriplex wrightii*) [A|N]

The distribution maps from websites offering information on this and other weeds sometimes disagree. The Encyclopedia of Life (EOL 2019) and Flora of North America (eFloras 2019) report Wright Saltbush (Fig. 9.1.1) grows below 4,000ft. However, the SEINet (2019) map showing the species around D-H is correct; the plant does fine in D-H (altitude 4,600ft). The conflict might indicate pressed plants were not present in the herbaria the describers were using when they wrote the descriptions.

Information reported in many published plant descriptions comes from studies of pressed and preserved plant specimens stored in herbaria. If no one has collected a specimen from a particular area, a botanist describing a species' distribution might not report it occurs in that area. Though not perfect, relying on herbarium specimens to describe plants is an important practice. The stored specimens provide proof to support published descriptions.

Flora of North America (eFloras 2019) relies on Watson (1874) for the plant description. Male flowers at top of plant are shown in the figure below (Fig. 9.1.2).



**Fig. 9.1.2** Wright Saltbush male flowers (photo © GR)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.1.3** Common Lambsquarters (*Chenopodium album*)--AMARANTHACEAE. One to seven feet high with mealy flowers and leaf bottoms. **Leaves:** Alternate, 1-5in long and 12-50cm wide. Higher leaves lanceolate and entire; lower leaves are egg or wedgeshaped with lobes at base and often with toothed margins. **Flowers:** Inconspicuous greenish flowers cluster on branch tips. **a.** Enlarged leaf and seed (**b.**) (Fig. 9.1.3 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### Common Lambsquarters (*Chenopodium album*) [A|E]

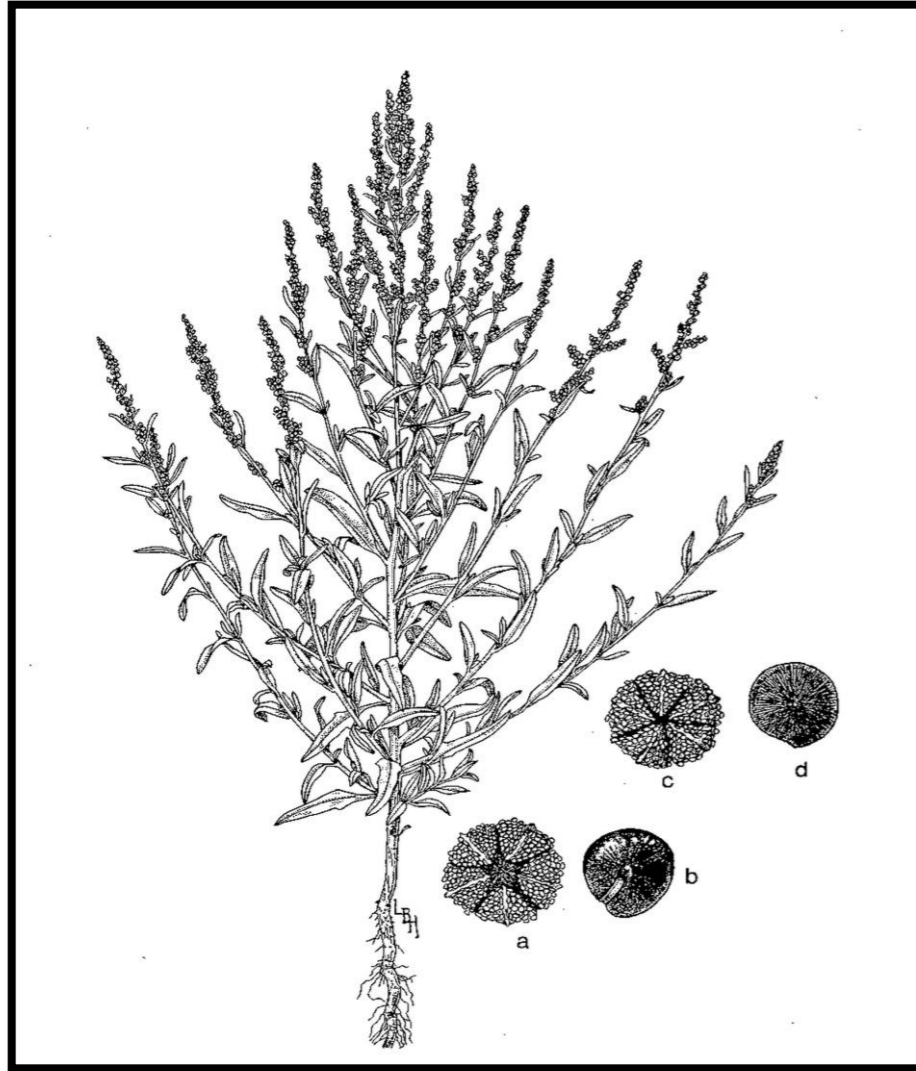
People have been cultivating and eating Lambsquarters (Fig. 9.1.3) for thousands of years. Asian and African farmers still plant it, but westerners consider it a useless weed. Cook the leaves or eat them raw but limit your intake as they contain high levels of oxalic acid. The seeds are high in protein, vitamin A, calcium phosphorus, and potassium.

Lambsquarters readily invades crops and disturbed habitats. And if it makes seeds, it is difficult to eradicate—its seeds remain viable for up to 40 years.

This tough nutritious plant could be one of our major crops on the other end of the Anthropocene (Fig. 9.1.4).



**Fig. 9.1.4** Lambsquarters flowering branch (© GR).



**Fig. 9.1.5** Narrowleaf Goosefoot (*Chenopodium desiccatum*)—AMARANTHACEAE. Annual 1-4ft high branching well above base and reproducing only from seed. **Leaves:** Narrow, pointed, white beneath, green above, 13-50mm long and 2-8mm wide (Fig. 9.1.5). **Flowers:** Stalkless, covered by white mealy scales, crowded on short branches in upper leaf axils and in *long leafless flowering branches at the tops of stems*. **Seeds:** Black shiny disks about 1mm in diameter. **a.** Fruiting calyx. **b.** Seed

Slimleaf Goosefoot (*Chenopodium leptophyllum*) is almost identical but has narrower leaves and dull seeds. **c.** Fruiting calyx. **d.** Seed (Fig. 9.1.5 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

### Narrowleaf Goosefoot (*Chenopodium desiccatum*) [A|EMN]

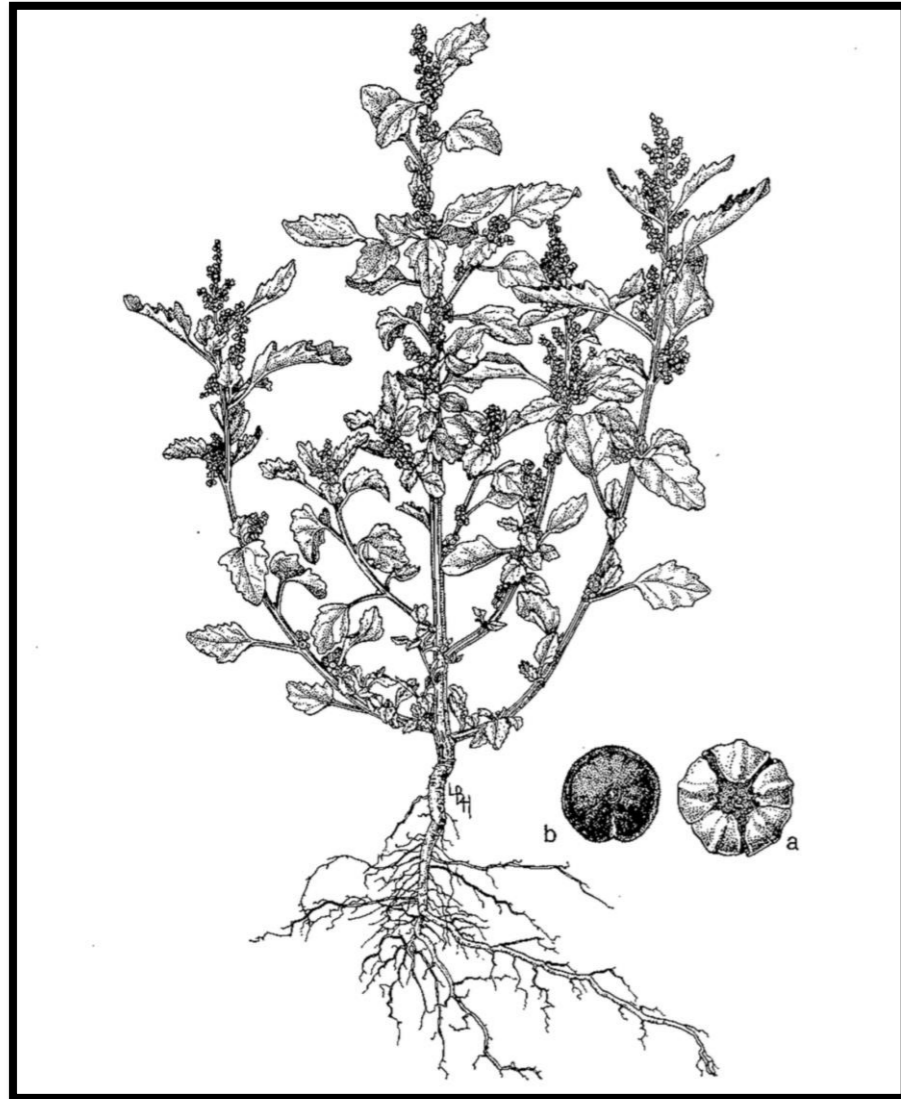
Narrowleaf Goosefoot expanded in D-H in 2017. It was surely present before 2017, but I hadn't noticed it. It is shorter and less troublesome than Kochia, which had dominated many sites.

The local deer squad and various insects eat Goosefoot, showing how native consumers might limit the abundance of native weeds (Figs. 3.1, 9.1.6).



**Fig. 9.1.6** This photo shows how delicious native insects find Goosefoot leaves (photo © GR)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.1.7** Nettleleaf Goosefoot (*Chenopodium murale*)—AMARANTHACEAE. A bushy annual 1-3ft high reproducing by seeds. Kittie Parker said it stinks (1972: 104), but others say it is odorless. See what you think. **Leaves:** Dark green, triangular, eggshapped alternate, pointed tips with one to eight teeth on each side. **Flowers:** With a fine granular coating cluster on short branches in leaf axils. **Seeds:** Tiny, black 1-2mm wide with a thin fruit wall and a distinct rim. **a.** Fruiting calyx. **b.** Achene with enclosed seed (Fig. 9.1.7 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

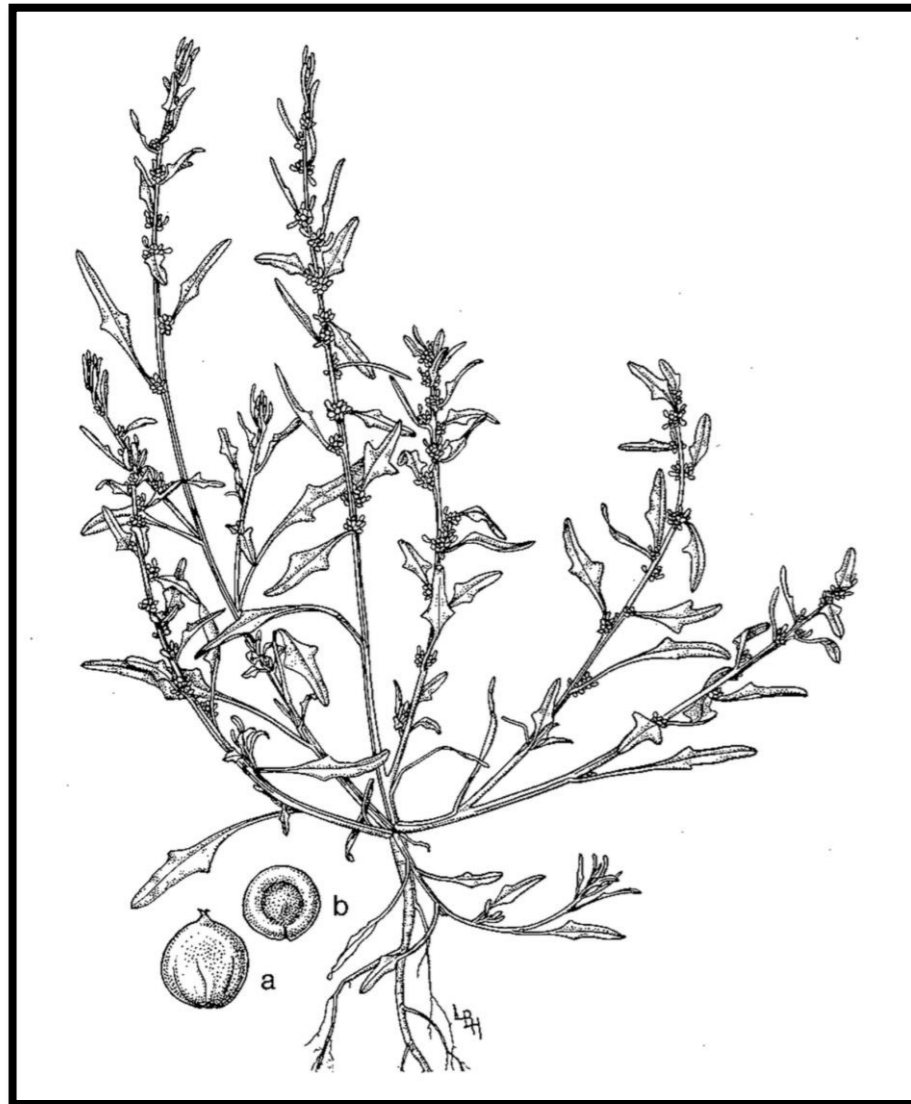
### Nettleleaf Goosefoot (*Chenopodium murale*) [A|EFM]

I haven't seen this weedy shrub (Fig. 9.1.8) in D-H yet, but it is probably here somewhere. Another common name for the plant is Australian Spinach though it is thought to have originated from the Mediterranean region. The CABI Invasive Species Compendium (CABI 2023) reports the plant is present in 43 countries.



**Fig. 9.1.8** Nettleleaf Goosefoot (photo © Stefan.Iefnaer)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



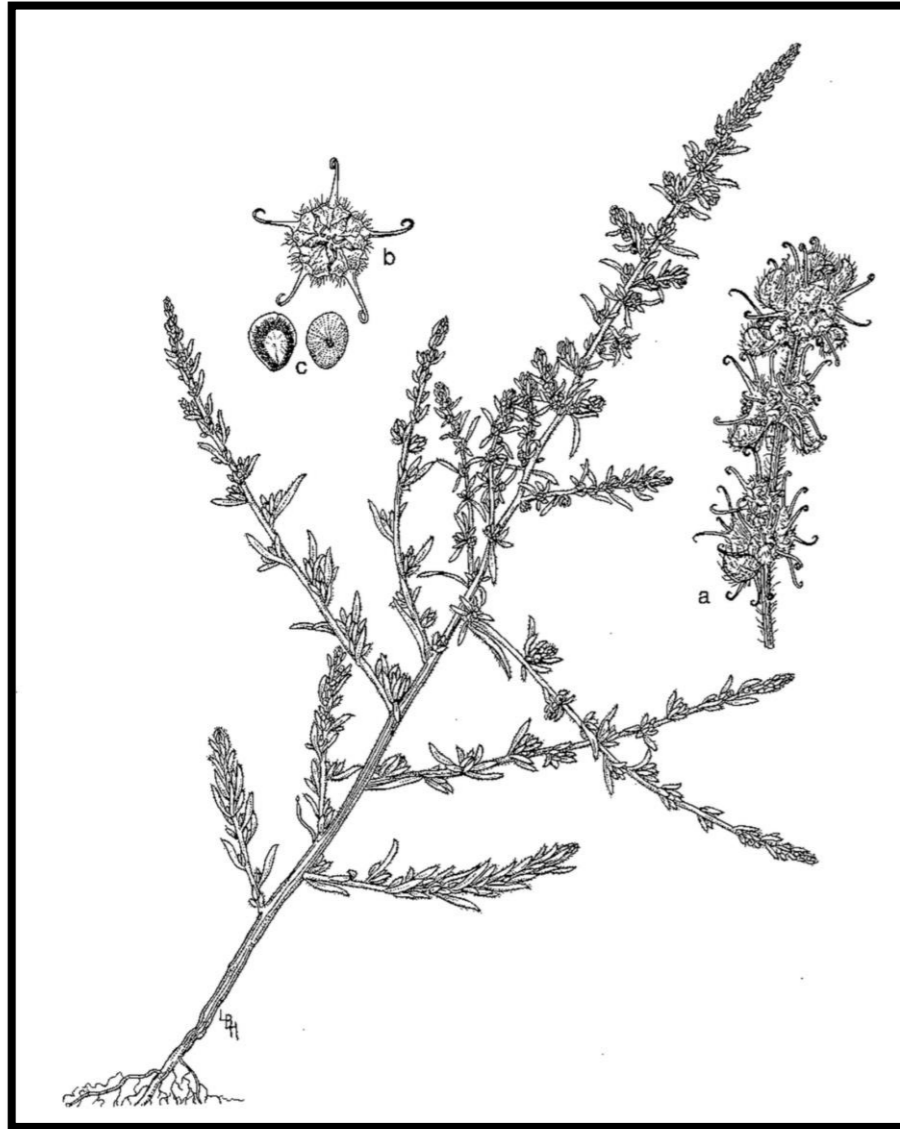
**Fig. 9.1.9** *Monolepis* (*Monolepis nuttalliana*)—AMARANTHACEAE. Annual 6-30in wide, 8in tall. Resembles other succulent species, but its *pointed and lobed leaves are unique*. **Leaves:** Bright green, alternate, 1-7cm long, lanceshaped with lobes near base (not stipules). **Flowers:** Inconspicuous green flowers cluster in axils of leaves in late spring to midsummer. **Seeds:** Round, flat, 1mm wide. **a.** Fruit. **b.** Seed (Fig. 9.1.9 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### ***Monolepis* (*Monolepis nuttalliana*) [A|EMN]**

*Monolepis* (Fig. 9.1.10) prospers on sunny, dry alkaline soils, but it can grow in partial shade and moist soils. It is present in Alaska, the Lower 48, and Mexico. The entire plant is edible by wildlife and people and has medicinal uses. Seeds are included in the seed vaults (Genesys 2023).



**Fig. 9.1.10** *Monolepis* (photo © Matt Lavin)



**Fig. 9.1.11** Fivehook Bassia (Smotherweed) (*Bassia hyssopifolia*)--AMARANTHACEAE. Erect annual 2-5ft tall with stout branches from the main stem. **Leaves:** Alternate, narrow, pointed, 6-13mm long. Each leaf axil has a cluster of shorter leaves or a short spike crowded with small leaves and flowers, all woolly with yellowish hairs. **Flowers:** Flower spikes longer at tips of stems sometimes forming branches 2-12in long. The tiny flowers have no petals. **Seeds:** Thin yellow hairy fruit has five separate chambers enclosing seeds. Each chamber develops a yellow hooked spine about 2mm long. Seeds are oval, about 2mm long with charcoal gray edges. **a.** Enlarged fruiting branch. **b.** Fruiting calyx. **b.** Seed (Fig. 9.1.11 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

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### Fivehook Bassia (Smotherweed) (*Bassia hyssopifolia*) [P|I]

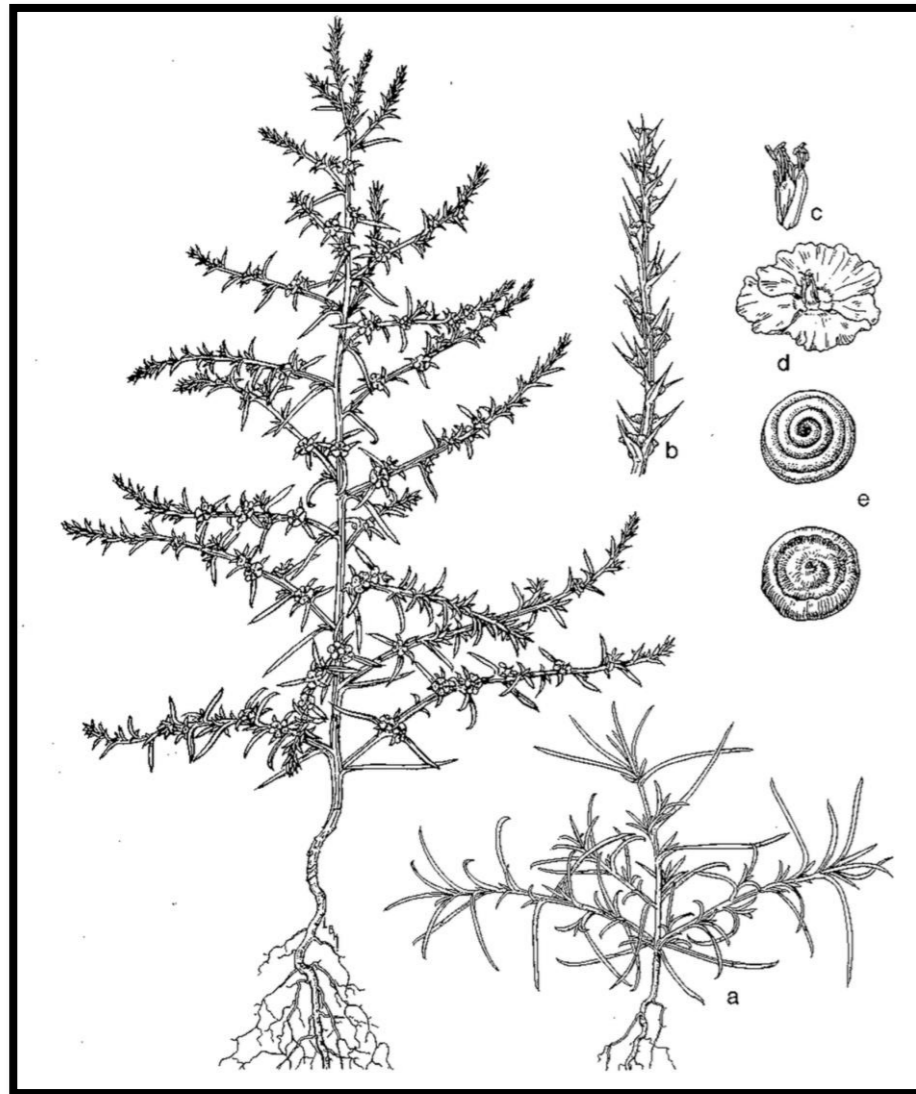
This weed's common name advertises the plant's principal means of dispersal: The hooks latch onto fabric and animal fur and ride along until brushed off or the fur sheds.

One ability of Fivehook Bassia (Figs. 9.1.12) botanists find most interesting is its occasional hybridization with Summer Cypress (*Kochia scoparia*). This occurs in North America but never in the plant's Eurasian home territory.

**Fig. 9.1.12** Fivehook Bassia bushy growth (photo © Forest & Kim Starr)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.1.13** Russian Thistle (*Salsola kali*)—AMARANTHACEAE. At maturity, a densely branched globular annual 6-72in tall with ridged, sometimes red, and sometimes red-streaked stems. Breaks from root when dry becoming a seed-dispersing tumbleweed. **Leaves:** Stiff awlshaped leaves ending in a spine replace soft early leaves. **Flowers:** Tiny, white, cluster at bases of leaves on upper branches. No petals. **Fruits:** Flower parts form wings that merge to cover the red fruit. Each fruit contains one gray to tan seed with shape of coiled embryo visible. **a.** Seedling. **b.** Fruiting branch. **c.** Flower. **d.** Fruiting calyx. **e.** Seeds (Fig. 9.1.13 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

### Russian Thistle (*Salsola kali*) [A|EI]

People imported this prickly tumbleweed (Fig. 9.1.14) to the U. S. by accident in grass seed from Asia. Over the past century, the plant has spread across the arid West. For decades, it has been familiar on roadsides, disturbed areas, and overgrazed ranges everywhere. Dense tumbleweed drifts form against fences and other barriers and in one instance, the heap accumulating at the head of a train blocked the engineer's vision forcing the train to stop.

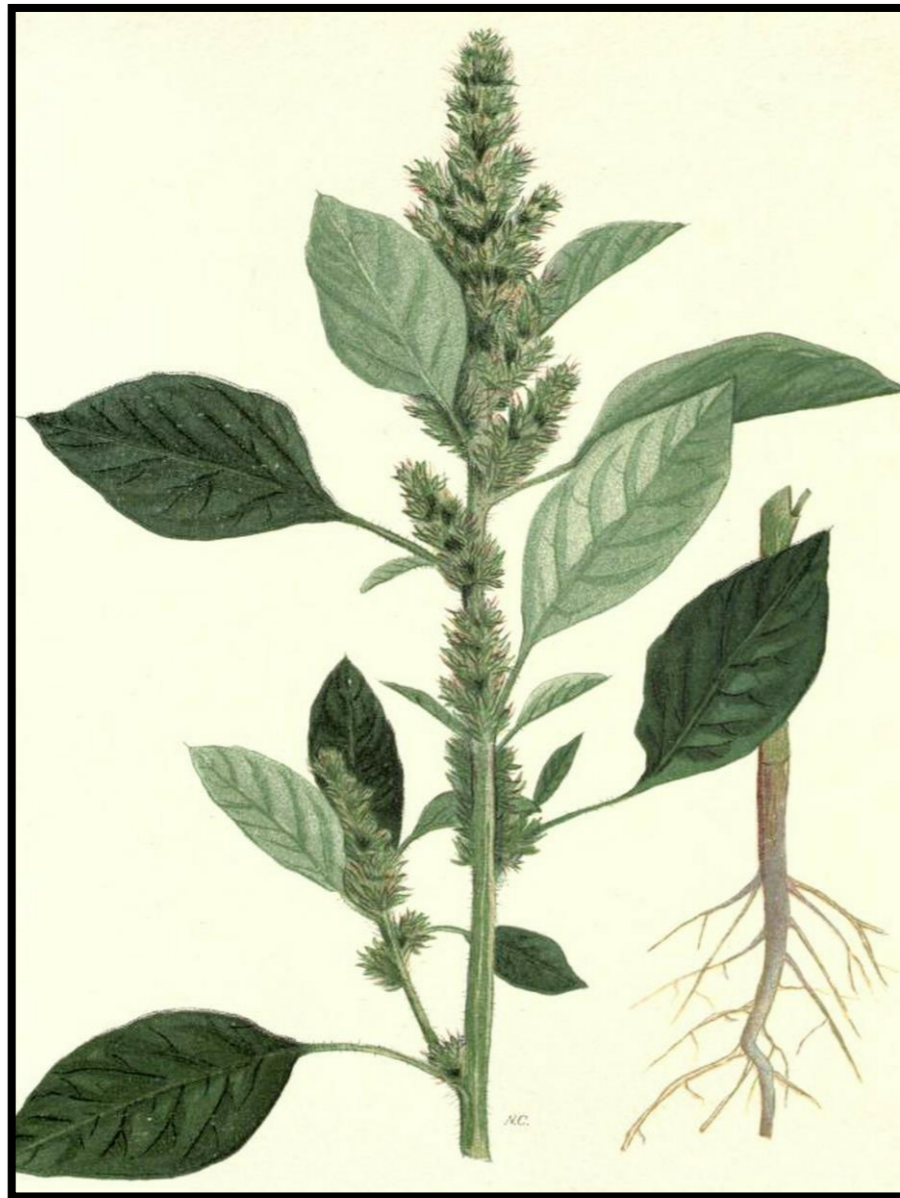
Tumbleweeds protect and restore soil better than some weeds. New shoots are edible, and some birds have learned to use the plants for cover. However, the weed is a misfortune for the West because it burns so well. When combined with other fuelweeds, it steps up fire frequency and this prevents succession back to the original vegetation.



**Fig. 9.1.14** Russian Thistle (photo © Dcrjsr)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]





**Fig. 9.1.15** Redroot Pigweed (*Amaranthus retroflexus*)—AMARANTHACEAE. Annual 1-3m tall. Thick main stem red near base breaks at maturity to allow plants to tumble along dispersing seeds. **Leaves:** Lower leaves oval or lanceolate, hairy beneath at least along veins, 5-15cm long. **Flowers:** Staminate (male) at tips of inflorescences with pistillate (female) flowers clustered beneath. Short spikes form in leaf axils, terminal spike longest, 5-20cm. **Seeds:** Black to dark brown in a capsule less than 2mm long with a lid that opens to reveal the tiny seed (Fig. 9.1.15 painting by Norman Criddle, 1909)

Weeds of Dewey-Humboldt, Arizona

### Redroot Pigweed (*Amaranthus retroflexus*) [A|EMN]

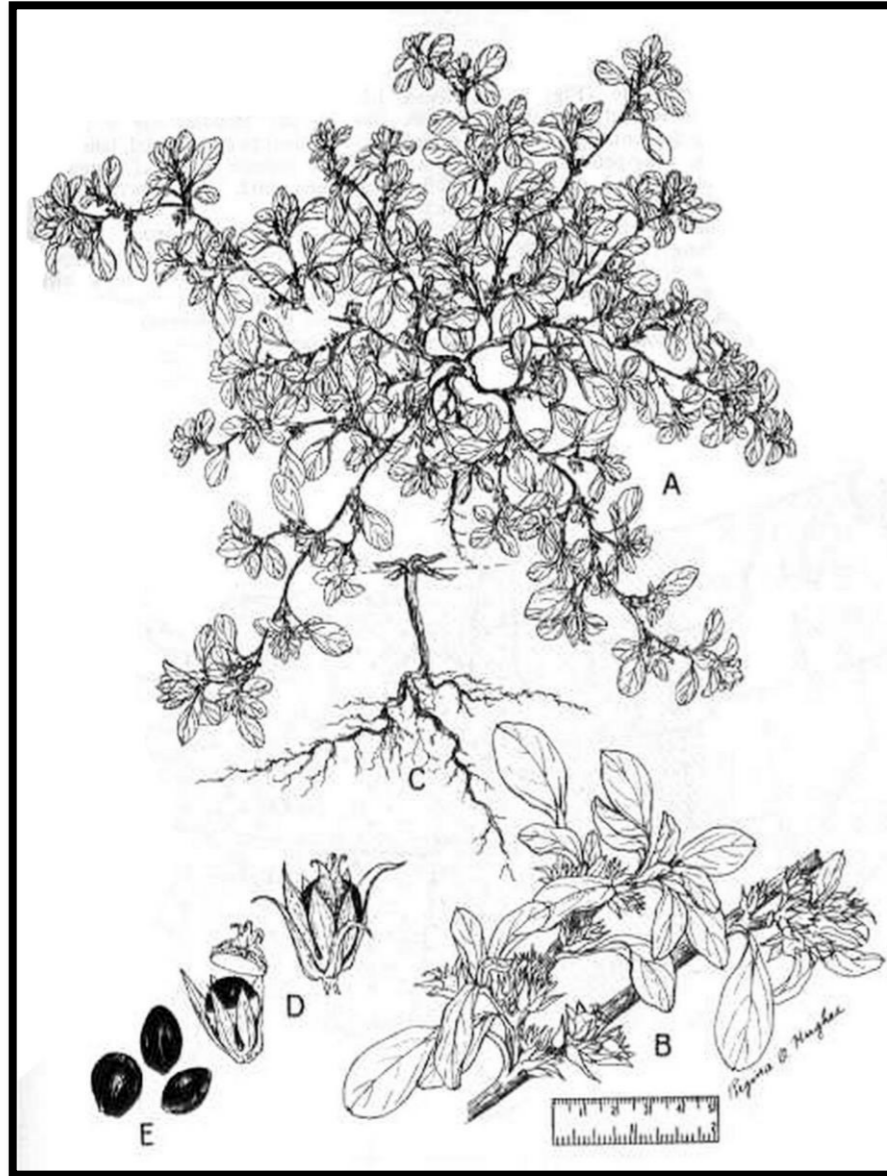
Redroot Pigweed (Figs. 9.1.16) can grow to 3m tall, but I've seen none more than half that. Size doesn't matter, however; the weed is so variable it can make a little tuft of flowers and seeds when it's 3in tall. I listed the plant as native, but it could have followed people into the Southwest from its tropical base farther south. Around D-H, it grows along roads, beside the Agua Fria River, and in gardens.

People cultivate Amaranthaceae for their seeds. Cultivars grow well in D-H with a modest amount of added water. The ones I grew for local birds produced heavy seed heads 30cm long, but the birds were not interested and the seeds fell to the ground. I did not follow their fate, but local harvester ants and rodents gathered some.

**Fig. 9.1.16** Redroot Pigweed seed head (photo © Bogdan)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.1.17** Prostrate Pigweed (*Amaranthus blitoides*)—AMARANTHACEAE. Branching, hairless, prostrate annual to 1m wide. **Leaves:** Alternate, spatulate blade 1-2cm long with smooth edges and with stalks half as long as blade. Prominent lateral veins distinguish the species from Common Purslane. **Flowers:** Green 2-9mm long pistillate flowers with three stigmas mixed with staminate flowers with three stamens. **Fruits:** Ovid utricle, the thin membrane covering the seed is 2mm long, seeds black 1-2mm in diameter. **a.** Spreading plant. **b.** Flowering branch. **c.** Root stock. **d.** Utricle. **e.** Seeds (Fig. 9.1.17 drawing by Regina O. Hughes, USDA)

Weeds of Dewey-Humboldt, Arizona

### Prostrate Pigweed (*Amaranthus blitoides*) [A|EFN]

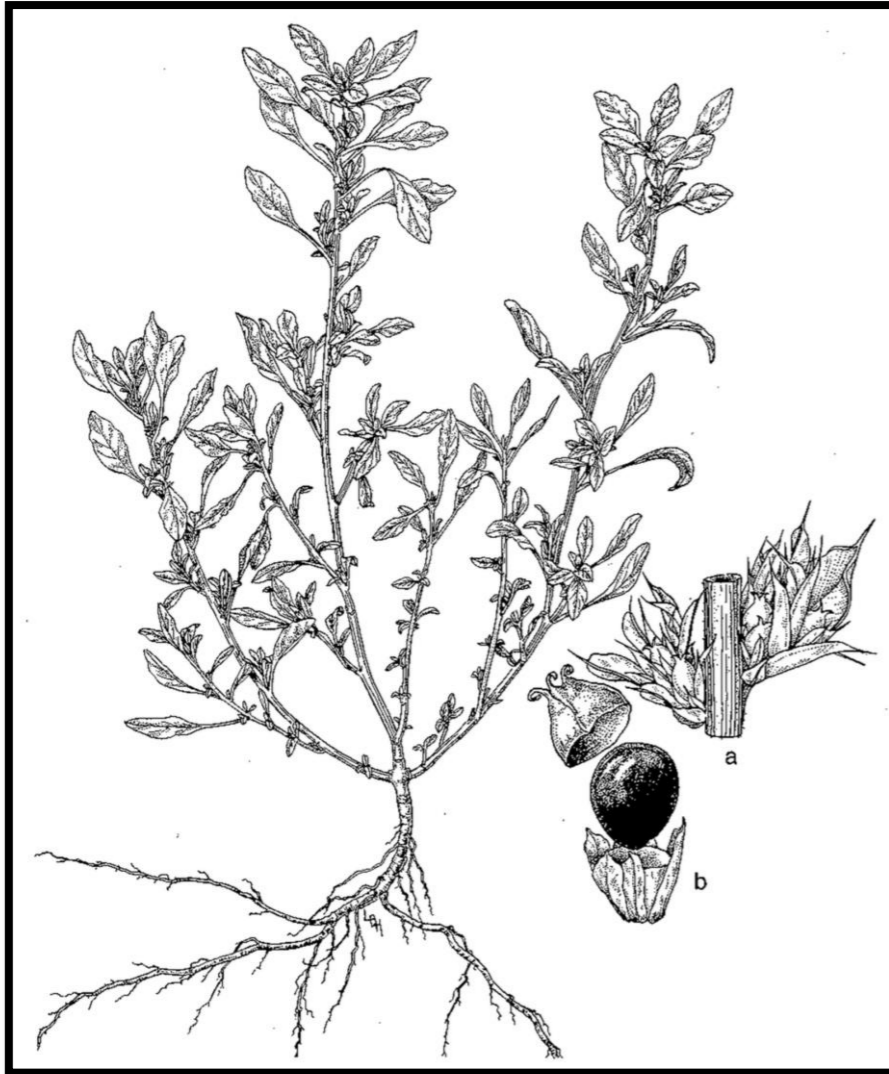
This native weed is unlikely to cause problems in D-H lawns and gardens. Though it has spread west with human roads and settlements, it is not aggressive, and it is not invasive. Where livestock grazing overwhelms native vegetation, however, Prostrate Pigweed joins other weeds colonizing the damaged areas.

Many weeds, like Prostrate Pigweed (Fig. 9.1.18), are edible, and can entice livestock to remain on a site long after soil microorganisms and longer-lived plants have been trampled into dust. This alone can create a semi-permanent weedland. Because many weeds are short-lived and dry out during summer, fire frequency increases and locks the weedland in place.



**Fig. 9.1.18** Prostrate Pigweed leaves and flowers (photo © SB Johnny)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.1.19** Tumble Pigweed (*Amaranthus albus*)--AMARANTHACEAE. Branched sticky annual 6-48cm tall with pale green or white stem, reproduces by seed. Often breaks off at base and blows along like a tumbleweed. **Leaves:** Alternate, 1-3in long, oblong, often purple beneath with veins and margins white edged. **Flowers:** Green in narrow clusters in leaf axils produce papery utricle that separates on an equatorial line freeing the top like a lid. **Seeds:** Shiny brown or black disks about 1mm across. **a.** Stem with flower clusters in leaf axil. **b.** Seed emerging from papery fruit (Fig. 9.1.19 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### Tumble Pigweed (*Amaranthus albus*) [A|N]

This small native tumbleweed is common in D-H, but less so than Russian Thistle the introduced tumbler. Many wildlife species have found uses for Tumble Pigweed (Fig. 9.1.20); the foliage hosts caterpillars of the butterfly *Pholisora catullus* (Common Sootywing) and at least three moth species. Mourning Dove and several songbird species eat the seeds. The plant is not desirable outside D-H, however because of its tendency to combine with introduced fuelweeds to create a fire hazard.

**Fig. 9.1.20** Fruit showing utricle "lid" above the seed (photo © Fischer et al.)





**Fig. 9.1.21** Palmer Pigweed (*Amaranthus palmeri*)—AMARANTHACEAE. Annual 1-6ft and sometimes 15ft tall. Thick main stem often turns red with age. **Leaves:** Lanceolate or eggshaped, alternate, hairless, 5-20cm long and 1-12cm wide with prominent white veins on lower surface (**a**). **Flowers:** Staminate (male, **b**) and Pistillate (female, **c**) flowers on different plants, on long leafless spikes. Central spike 6-18in long. Both male and female flower parts stiffen to spines at maturity. **Seeds:** Dark brown, oval, about 2mm long (**d**) (Fig. 9.1.21 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### Palmer Pigweed (*Amaranthus palmeri*) [A|EMNP]

Amaranths are a minor irritant in crops and gardens and on the margins of lawns, roads, and other disturbed areas. However, Palmer Pigweed and other Amaranth species have many uses. There was one warning by Moore (2003) worth noting: "Do not grow where inorganic nitrates are added to the soil—or even overly rich [say from manure additions] soil; the Amaranths concentrate nitrates and can be accumulatively toxic" (Moore 2003: 29).

Palmer Pigweed (Figs. 9.1.22) and other native amaranths are consumed by numerous wildlife species (Fig. 3.1).

As many other weeds have done, Palmer Pigweed has evolved resistance to glyphosate (the main poison constituent of Round-Up).

**Fig. 9.1.22** Palmer Pigweed  
(photo © GR)





**Fig. 9.1.23** Kochia (Summer Cypress) (*Bassia scoparia*)--AMARANTHACEAE. Thornless bushy annual grows to 4m tall. **Leaves:** Alternate, stalkless, more or less hairy, 2-5cm long, 3-7mm wide. **Flowers:** Solitary or paired in axils of leaf-like bracts, stalkless, green, with five triangular sepals and no petals. Grow on hairy spikes 5-10cm long. **Seeds:** Persistent 2-3mm wide sepals enclose one 1-2mm wide, wedge-shaped, flat seed (Fig. 9.1.23 photo © GR)

Weeds of Dewey-Humboldt, Arizona

### **Kochia (Summer Cypress) (*Bassia scoparia*) [A|IP]**

Kochia originated in Europe and has become abundant throughout North American deserts. The plants produce seed when as small as 3in tall, and many more seeds up to their maximum height of about 13ft. Large plants get so dense they impede movement (Fig. 9.1.23). When they dry out in the fall, they are a serious fire hazard (Fig. 9.1.24).

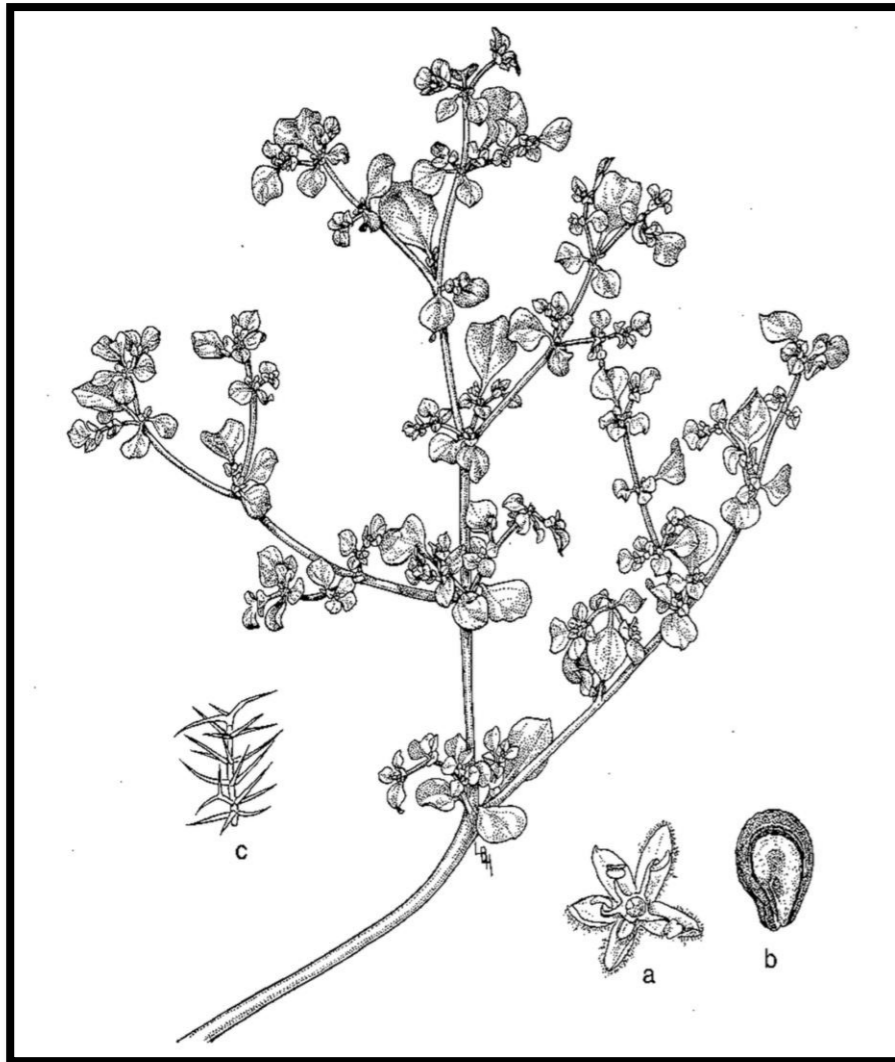
The plant was present in a few spots around D-H until 2012 when it made rapid gains. Two years earlier the last of our rescued cows died. I stopped irrigating the pastures, and as the grass dried, Kochia and other weeds spread. Kochia has taken over with 2-3ft tall plants in the dry sections of the pastures and taller plants in the wetter areas. It does not grow in the shade



of any of the trees.

**Fig. 9.1.24** Dry Kochia stunted by drought (photo © GR)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.1.25** Woolly Tidestromia (*Tidestromia lanuginosa*)--AMARANTHACEAE. Erect or prostrate annual appears after start of summer rains, 3-18in stems can reach 30in; reproduces from seed; white stems often bright scarlet by fall. **Leaves:** Hairy, opposite, oval, 8-50mm long. The hair wears off the upper surface revealing the green beneath. The two opposite leaves are usually not the same size. **Flowers:** Yellow about 3mm long in clusters in leaf axils; five stamens and five segments. **Seeds:** small, almost globular. **a.** Flower. **b.** Seed. **c.** Branched hair (Fig. 9.1.25 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### Woolly Tidestromia (*Tidestromia lanuginosa*) [A|N]

This native weed is abundant in North America from the southern Great Plains west to the Mojave Desert. It is uncommon in the cold Great Basin Desert. Kittie Parker says it is most conspicuous after summer rains when it forms whitish mats between desert shrubs and trees on mesas, slopes, and plains (Fig. 9.1.26). I've had limited experience with Woolly Tidestromia, but I expect hoeing and pulling will keep it in check.



**Fig. 9.1.26** Woolly Tidestromia (photo © Pompilid)

## 9.2 DOGBANE FAMILY—APOCYNACEAE



**Fig. 9.2.1** Periwinkle [*Vinca minor* (above) *Vinca major* (below)]—APOCYNACEAE. Glossy green vines. **Leaves:** Opposite, *V. major* leaves are widest below the middle and have fine bristly hairs along the edges. *V. minor* leaves are widest at the middle. **Flowers:** Blue or violet with asymmetrical petals seeming to spin clockwise about the central funnel. **Fruits:** Two capsule-like pods (follicles). *V. major*'s contain many seeds and *V. minor*'s contain 4-8. Other than seed number and size (Fig. 9.2.2), the species are remarkably similar. (Fig. 9.2.1 photo © GR)

Weeds of Dewey-Humboldt, Arizona

## Periwinkle (*Vinca major* and *Vinca minor*) [P|IM]

These evergreen perennials (Fig. 9.2.3) originated in the Mediterranean region and have been cultivated in Europe for centuries. They are common throughout North America and less common in South America. Though most nurseries sell these plants, they are invasive and are a threat to native plants in moist shady areas along desert streams and in moist canyons. They do not spread in dry uplands without supplemental moisture.

**Fig. 9.2.2** Periwinkle leaves: *Vinca minor* above, *Vinca major* below (photographer unknown)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]

### 9.3 MILKWEED FAMILY—ASCLEPIADACEAE



**Fig. 9.3.1** Inmortál (*Asclepias asperula*)—APOCYNACEAE. Unbranched stems ascending or lying on the ground. **Leaves:** Lanceolate 5-19cm long, 6-27mm wide, irregularly spaced, alternate. **Flowers:** umbels (flowers on stalks arising from a common point like an umbrella blown inside out) at ends of branches, 4-7cm wide, peduncles 20-30cm long; corolla green, bowl shaped with curved-ascending lobes 9-12mm long; sessile hoods attach along the entire height of the column. **Fruit:** seedpods 3in long contain many flat seeds. Each seed has a tuft of fine 1in long, silky white hair (Fig. 9.3.1 photo © Max Licher)

Weeds of Dewey-Humboldt, Arizona

### Inmortál (*Asclepias asperula*) [P|NM]

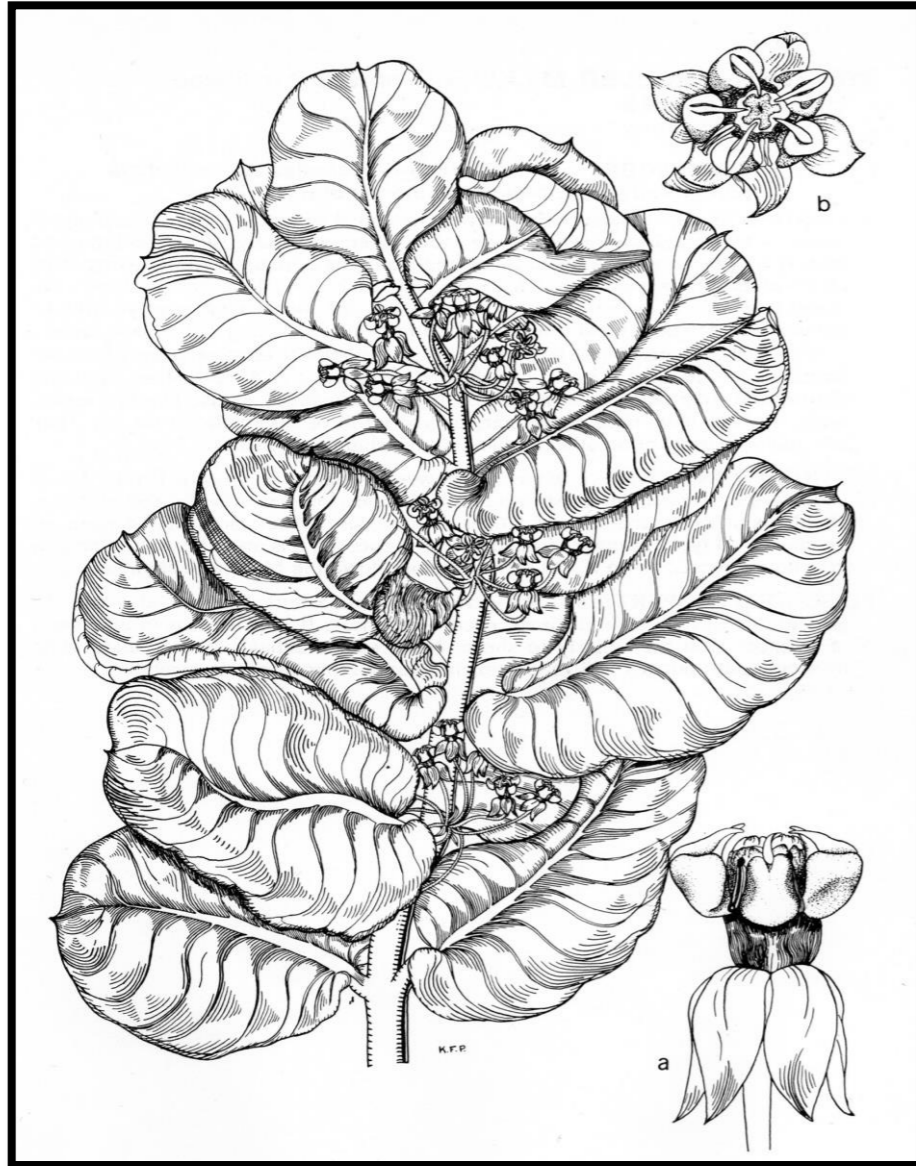
Widespread, but not abundant, Inmortál (Figs. 9.3.1-2), like other milkweeds, serves as a host for Monarch butterfly caterpillars. It has potent medicinal properties, but you should read Moore (2003) before trying it.

**Fig. 9.3.2** Inmortál seedpods (photo © Stan Shebs)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]





**Fig. 9.3.3** Broadleaf Milkweed (*Asclepias latifolia*)—APOCYNACEAE. Erect stems 40-110 cm tall. **Leaves:** Opposite, broad, elliptical, 5-14cm long, 4-12cm wide, short woolly when young. **Flowers:** Fragrant, green to cream-colored. Umbels at most upper nodes, 4-8cm broad, sessile or with peduncles 2-3cm long. Green calyx 4mm long; corolla green with lobes 7-10mm long, whitish to yellow-brown hoods. **Fruit:** Seedpods 7-9cm long. **a.** Flower with reflexed petals with rising hoods and inward-pointing horns (Fig. 9.3.3 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

### Broadleaf Milkweed (*Asclepias latifolia*) [P|DN]

This big-leaved milkweed (Figs. 9.3.3-4) ranges from the southern Great Plains across the Chihuahuan and Sonoran Deserts to the Mojave Desert in the west and the southeastern Great Basin Desert in the northeast. Like all milkweeds, it has bitter sap and hosts Monarch Butterfly caterpillars.



**Fig. 9.3.4** Broadleaf Milkweed (photo © Anthony Zukoff)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.3.5** Western Whorled (Horsetail) Milkweed (*Asclepias subverticillata*)--ASCLEPIADACEAE. Bushy perennial to 4ft tall reproduces by seed and from roots. **Leaves:** Two-four long narrow leaves 3-5in long to 8mm wide in whorls at stem joints. **Flowers:** Greenwashed white in umbels at tips of branches and in leaf axils. **Seeds:** Copious, brown 6mm long with tuft of hair in slender pointed pods 2-4in long. **a.** Seedpod. **b.** Flower. **c.** Seed with tuft of silky hair (Fig. 9.3.5 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

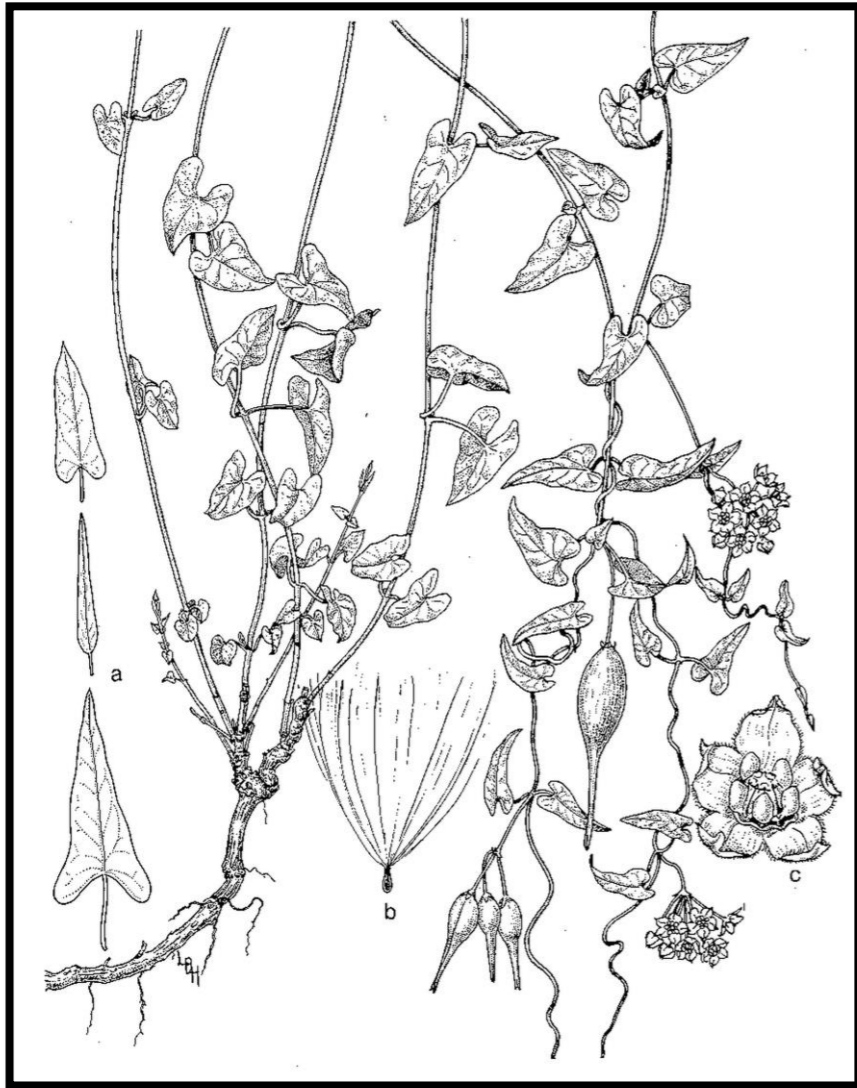
### Western Whorled (Horsetail) Milkweed (*Asclepias subverticillata*) [P|DN]

Similar in distribution to Broadleaf Milkweed (Figs. 9.3.3-4), Horsetail Milkweed (Figs. 9.3.6) is the most common milkweed around D-H. Quite similar species occur east (*A. verticillata*) and to the west (*A. fascicularis*) Horsetail Milkweed is preferred by Monarch Butterflies. Patches as small as six plants will attract Monarchs. Residents of the western U. S. might wish to learn more and order milkweed seeds from the Southwest Monarch Study website (2019).



**Fig. 9.3.6** Horsetail Milkweed (photo © GR)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.3.7** Climbing Milkweed (*Sarcostemma cynanchoides*)—APOCYNACEAE. Long twining stems 8-40ft long. **Leaves:** In pairs with slender stalks from 2-50mm long. Width varies from 2-44mm with tapered or rounded bases or both combined. Can be heartshaped, arrowshaped, or lobed 1-6cm long. **Flowers:** 15-25 fragrant flowers on slender stalks in umbel clusters typical of milkweeds. Flowers white, ivory, or purple. **Seeds:** Seedpods brown, 4-9cm long and 8-16mm wide. Brown seeds are 3-6mm long with a tuft of soft hairs at narrow end (**a.** Leaf variation. **b.** Seed. **c.** Flower). (Fig. 9.3.7 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### Climbing Milkweed (*Sarcostemma cynanchoides*) [P|DN]

This native weed will climb on anything from fences to shrubs to trees. It spreads on dry wash banks, across gardens, and into cultivated fields. Flowers appear from May to September and seedpods persist until November.

Climbing Milkweed (Figs. 9.3.8) hosts Monarch and Queen Butterfly caterpillars but not as often as members of the milkweed genus *Asclepias*. There were many traditional uses for milkweeds and some of these continue today.

**Fig. 9.3.8** Climbing Milkweed (photo © Curtis Clark)



## 9.4 DAISY FAMILY—ASTERACEAE



**Fig. 9.4.1** Rough Fleabane (*Erigeron divergens*)—ASTERACEAE. Perennial, small to about 1ft tall by 1ft wide, green, hairy, soft, stems trailing to ascending. First flowers about March 1. **Leaves:** 2-3cm long, 2-3mm wide; spatulate to linear, basal immature leaves often with 1-2 (rarely 4) pointed lobes; upper leaves partially clasping, often smaller than lower ones. **Flower** heads born alone 2-4cm above last leaf; buds sometimes red. Hair on flower stalks longer and denser near and onto phyllaries. **Phyllaries** persistent, 40-50 in 2-3 series, lanceolate boat shaped with acute tips, villous. Involucre, shallow hemispheric cup 8-12mm wide, becomes convex as it dries. **Ray flowers** 70-100 thin, longitudinally curled (some almost a tube), corollas lavender to white, 5-10mm long, .6-1.2mm wide; narrow, linear, pointed, boat shaped. **Disk flowers:** 150-200, yellow, tubular with five lobes, 10-20 silvery-white pappi shorter than corolla (Fig. 9.4.1 photo © GR)

## Rough Fleabane (*Erigeron divergens*) [P|DMN]

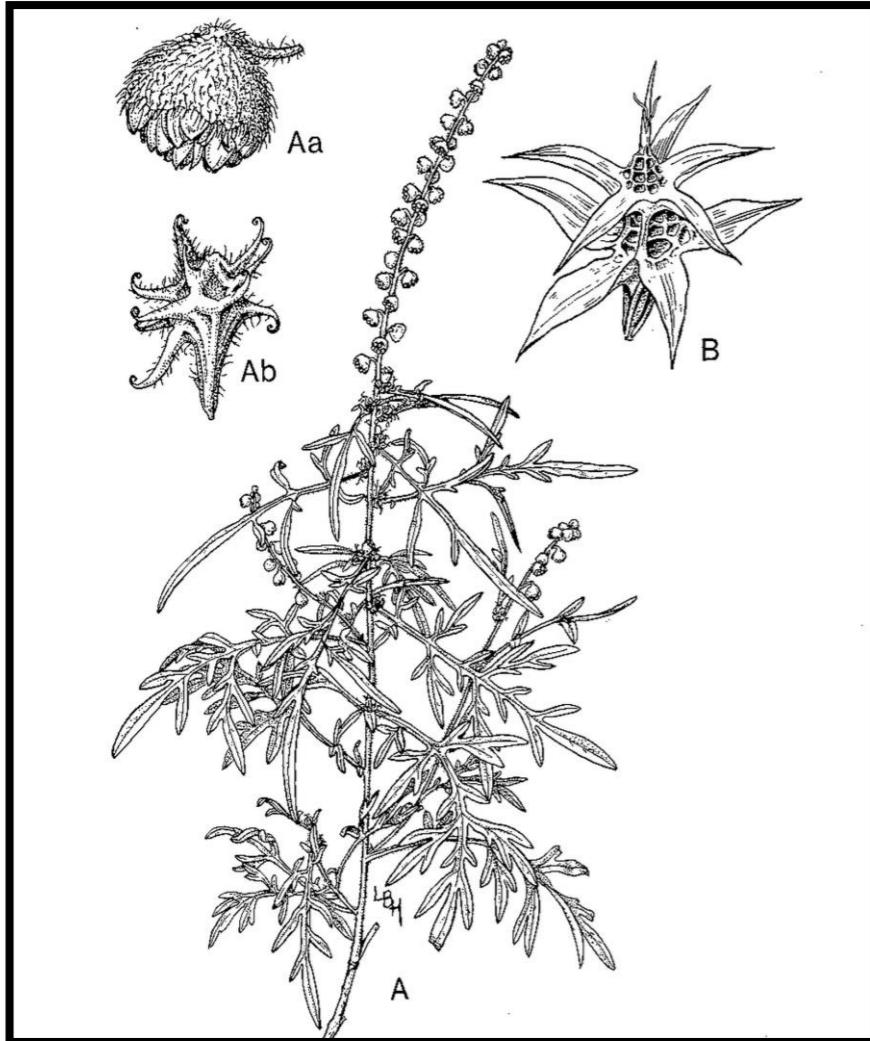
This small weed is common along roadsides and in most valley and foothill vegetation throughout arid North America and a few spots in South America.

The American Ethnobotany database lists several reports of the value of Rough Fleabane for good fortune, eyewash, childbirth, and more.

Around human settlements, Rough Fleabane (Figs. 9.4.2) colonizes exposed soil of roadsides, gardens, and construction sites. It has no barbs or thorns, and I have seen no cases where it invaded taller or denser vegetation. The standard controls—mulch, shade, and pulling—should work well. The plant's small flowers appear early. They feed bees and other arthropods active on warm winter days and during early spring when few other flowers are available. The bugs the flowers attract supply food for insectivorous birds such as Shrikes. This is a desirable weed.

**Fig. 9.4.2** Fleabane (photo © GR)





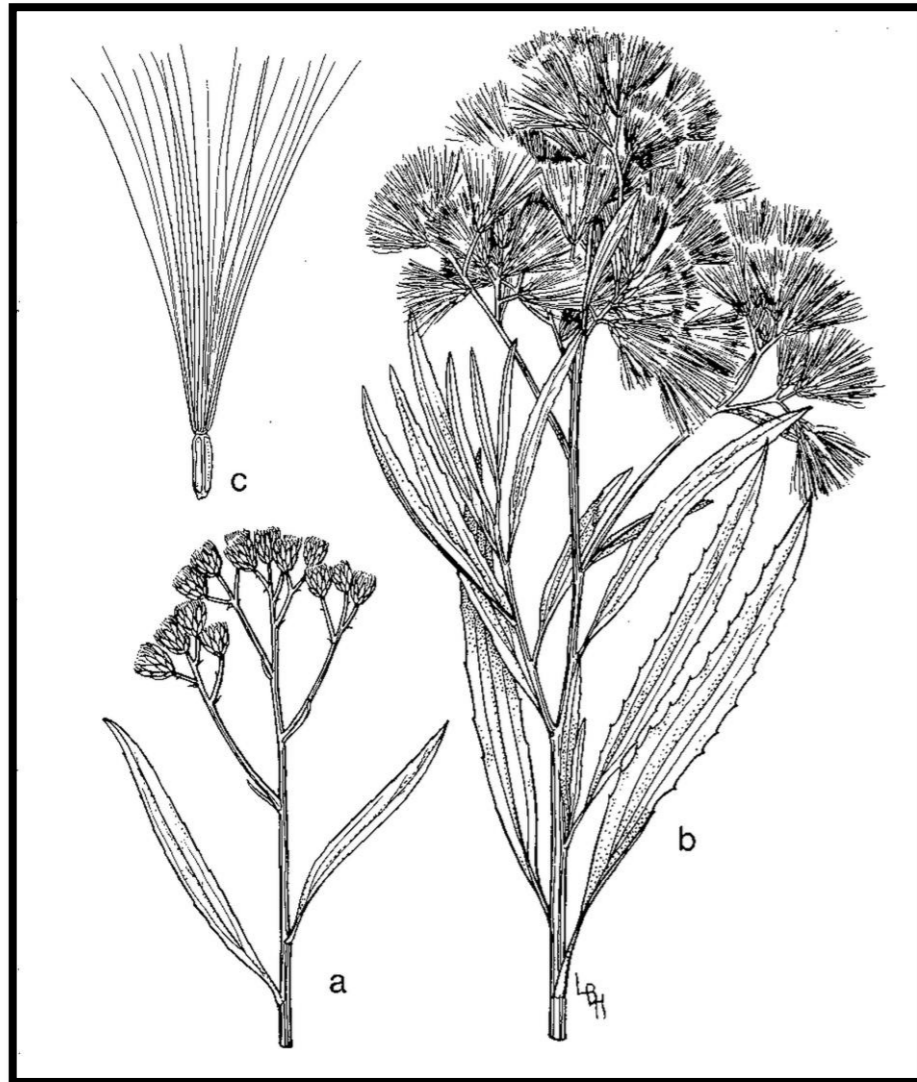
**Fig. 9.4.3** Slimleaf Bursage (*Ambrosia confertiflora*)—ASTERACEAE. Bushy perennial 1-3ft tall reproducing by seed and by sprouts from slender creeping roots. **Leaves:** So hairy they appear gray; alternate, 2-5in long, with narrow lobes often divided into smaller lobes. **Flowers:** Spikes at tips of branches 2-5in long with tiny male flowers in green drooping involucre. Female flowers cluster in leaf axils below males; almost invisible until they mature into spiny little burs 2-3mm long with 10-20 curved spines about 1mm long with hooked tips. **Seeds:** Each bur encloses 1 or 2 achenes. **A.** Slimleaf Bursage showing finely-divided leaves and male flowers above females in leaf axils. **Aa.** Enlarged male head with male flowers. **Ab.** Mature female flower (bur) with curved, hooked spines. **B.** Annual Bursage (*A. acanthicarpa*). Mature female flower head (bur) with straight spines (Fig. 9.4.3 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### Slimleaf Bursage (*Ambrosia confertiflora*) [P|ENT]

Not following my own weed-control advice, I acted late, and this weed formed a colony beside my front gate. I have pulled the shoots every year for at least ten years and still they come. The tenacity of this character is due to another negligence of mine; I often forget to pull the shoots when they first appear in spring. The delay gives them time to harvest and store a little solar energy for next year. Slimleaf Bursage (Fig. 9.4.4) ranges from the southern Great Plains west to the Pacific coast and south to central Mexico.



**Fig. 9.4.4** Slimleaf Bursage (photo © Max Licher)



**Fig. 9.4.5** Seepwillow *Baccharis salicifolia*—ASTERACEAE. Shrubs with clusters of stems 1-4m tall reproducing only by seed. Stems woody 12-25mm in diameter at base. **Leaves:** Willowlike, 3-15cm long and 6-16mm wide with small teeth. **Flowers:** Pale green to white, 5mm wide in clusters at tip of main branches; male and female on separate plants. **Fruit:** Oblong achene 1-2mm pale tan to greenish brown with 5 white ribs and a tuft of silky white hair 5mm long. **a.** Branch from male plant with male heads. **b.** Branch from female plant with female flowers in fruit. **c.** Seedlike achene with tuft of silky hair (Fig. 9.4.5 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

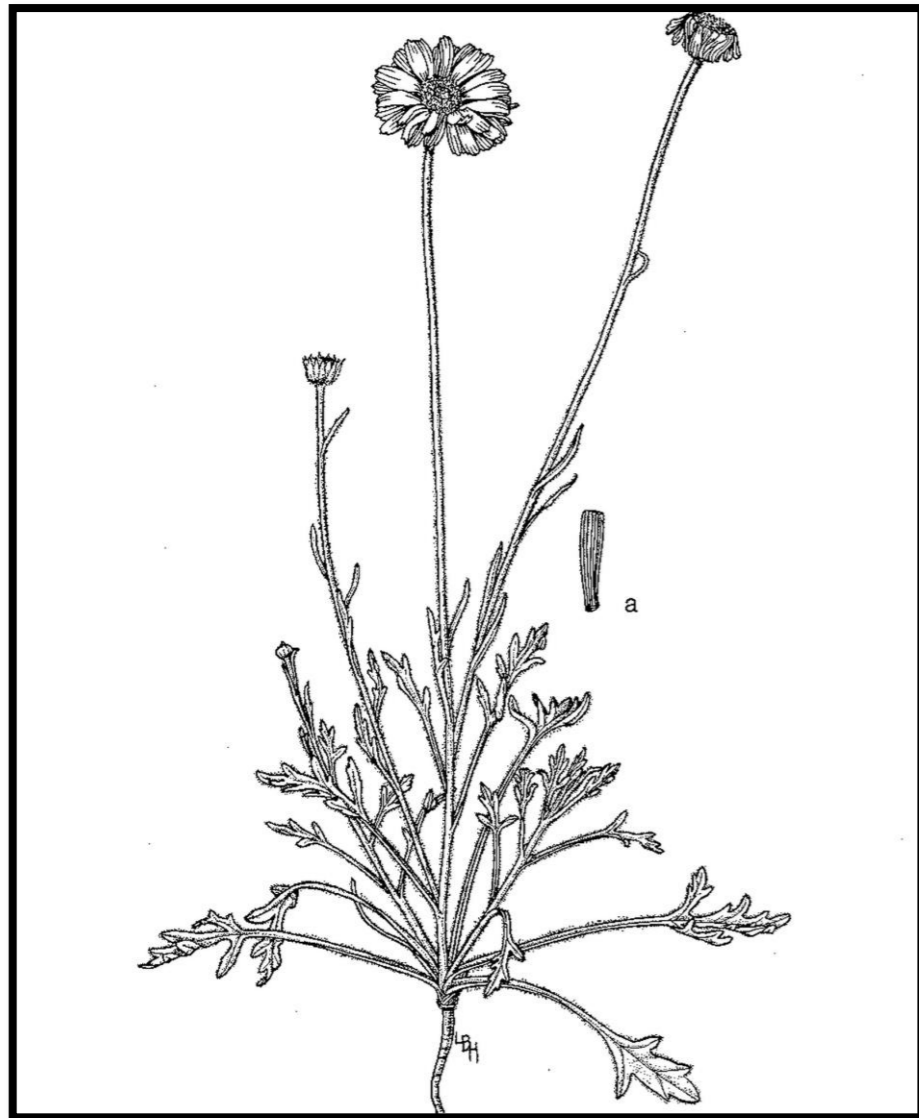
### Seepwillow *Baccharis salicifolia* [P|MN]

This big native shrub is common along streams and washes in arid southwestern North America, Central America, and South America. It is most abundant in the Arizona Uplands subdivision of the Sonoran Desert. It was common in the dry Salt River channel in Tempe. Livestock do not eat it so it increases where livestock grazing is heavy (Fig. 9.4.6).



**Fig. 9.4.6** Seepwillow (photo © Krzysztof Ziarnek)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.4.7** Desert Marigold (*Baileya multiradiata*)—ASTERACEAE. Low, gray-green woolly biennial with a thick taproot and several woolly stems 6-18in tall. Stems have leaves on lower half and end with one flower head composed of many ray and disk flowers. **Leaves:** Alternate, woolly, lobed, and clustered at base of plant. **Flower heads:** Bright yellow, 2-4cm wide with 20-50 ray flowers (petals). The rays dry and droop with age. Each head produces at least 100 rod-shaped disk flowers about 3mm long, light brown with longitudinal ridges on the surface (Fig. 9.4.7 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

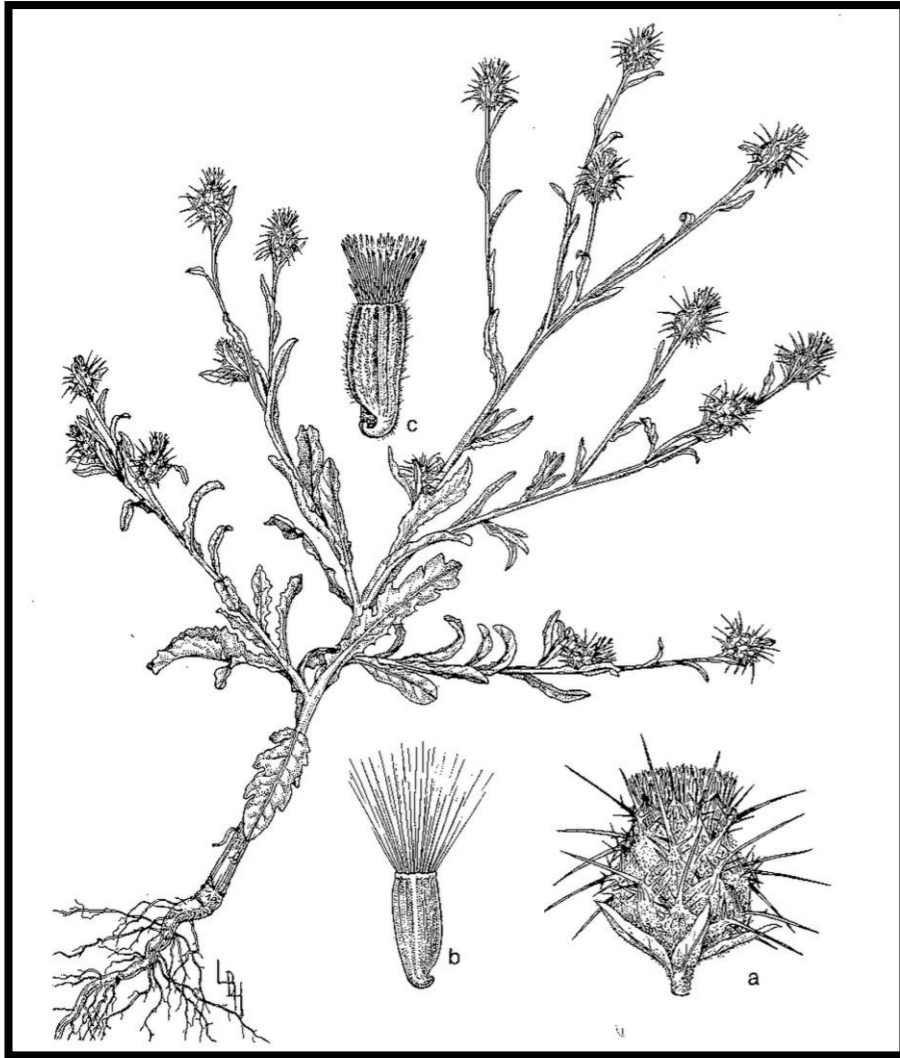
### Desert Marigold (*Baileya multiradiata*) [B|DN]

This beautiful native of western North America is common along roadsides below 5,000ft in all four North American deserts. The flowers are the preferred caterpillar incubator for Desert-Marigold Moth (*Schinia miniana*), a flower moth of the Noctuidae family. I haven't seen this moth, but it is present around the region (Fig. 9.4.8).

**Fig. 9.4.8** Desert Marigold (photo © Chris English)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.4.9** Malta Starthistle (*Centaurea melitensis*)—ASTERACEAE. Tomentose grayish green annual 1-2ft tall with winged stems. **Leaves:** Basal leaves 2-5in long lobed. Upper leaves alternate, narrow and unlobed with bases extending down the stem as narrow wings. **Flowers:** Heads about 13mm high with stiff bracts bearing slender spines 3-10mm long incloses small tubular bright yellow flowers. **Seeds:** Achenes hairless, gray to brown, about 3mm long with hooklike notch just above base. Has three rows of white bristles. **a.** Flower head enclosed in spiny bracts, spines of middle bracts branched near their base. **b.** and **c.** Achenes with hooklike notch (Fig. 9.4.9 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

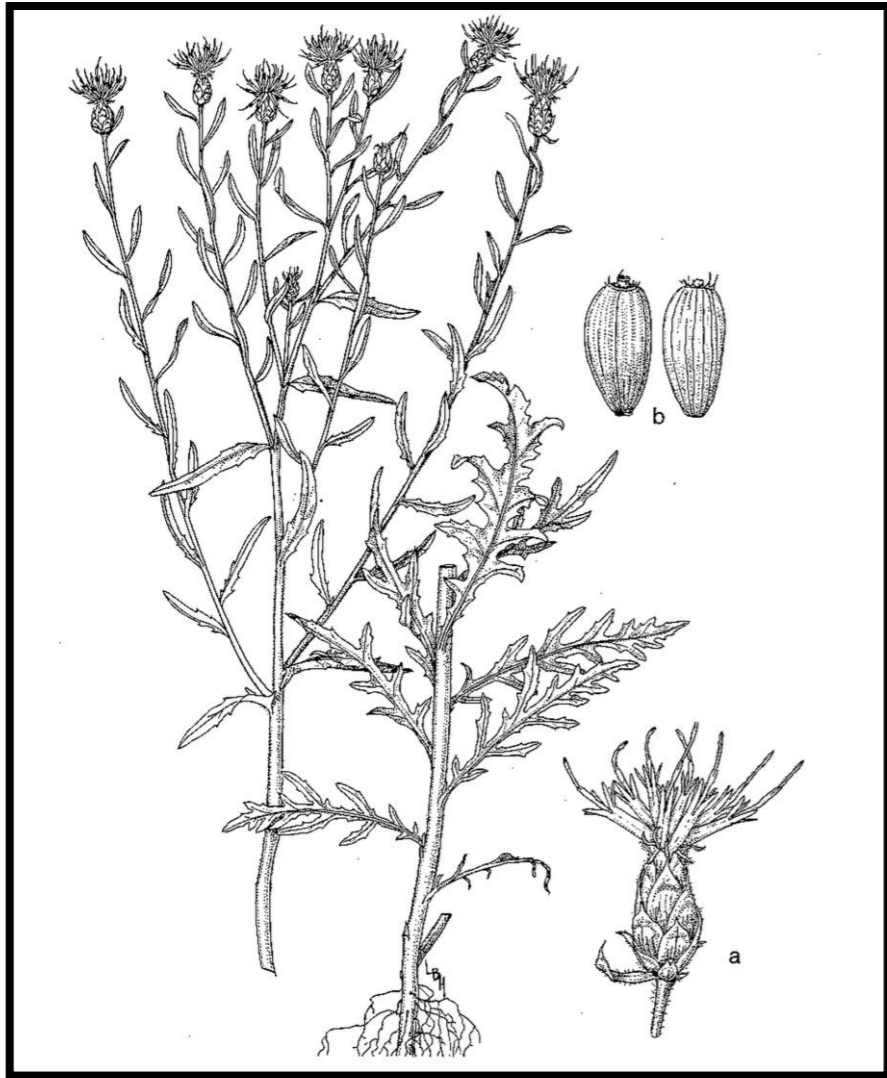
### Malta Starthistle (*Centaurea melitensis*) [A|P]

Malta Starthistle is present in all North American deserts and the east slope of the Andes Mountains in Argentina. People introduced it to the New World from the Mediterranean region of Europe and Africa. The first documented presence in the U. S. was at an adobe house built in San Fernando in 1797 (Encyclopedia of Life). A single specimen, popped up in a Virginia Creeper bed beside my house in 2019. The seeds are wind dispersed, so the weed will soon appear elsewhere. The sharp rather intimidating spines are more for defense from grazing than for seed dispersal (Fig. 9.4.10).



**Fig. 9.4.10** Malta Starthistle (photo © Franco Folini)





**Fig. 9.4.11** Russian Knapweed (*Acroptilon repens*)—ASTERACEAE. Perennial shrub 1-3ft high reproduces by seeds and shoots from underground rhizomes. Soft gray hair covers young stems and leaves. **Leaves:** Lower leaves 2-4in long, 12-36mm wide with deep lobes. Upper leaves smaller and less lobed to lobeless. **Flowers** Coneshaped flower heads 6-13mm wide at branch tips contain 15-20, 5-lobed lilac to blue to rose pink flowers. Overlapping rows of pearly bracts surround the heads. Lower, outer bracts with rounded papery tips, upper, inner bracts with hairy tail-like tips. **Seeds:** Gray or ivory achenes 3-6mm long have white bristles at the top. A. Five-lobed tubular flowers in heads surrounded by bracts. B. Achenes with remnant bristles (Fig. 9.4.11 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

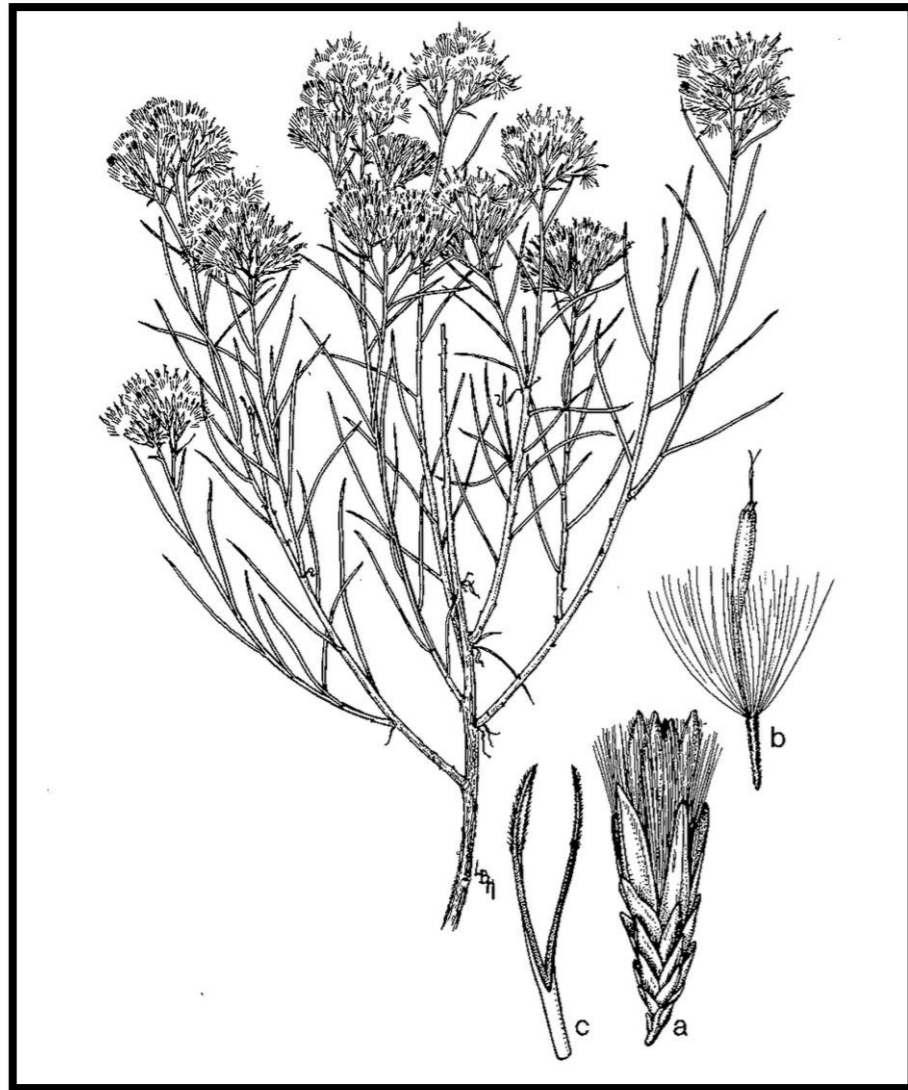
### Russian Knapweed (*Acroptilon repens*) [P|ITZ-2]

This small Eurasian thistle has an attractive flower, but it is not a desirable plant. It forms dense stands from extensive root systems, and it produces toxic chemicals. These competitive mechanisms give Russian Knapweed the power to invade and replace native vegetation in the western U. S. Once it becomes established, the root system makes eradication difficult. This is one of those weeds where we follow the weed manager's rule, *Early Detection and Rapid Response* (EDRR) without question. Cut or pull the plant and repeat until no more sprouts appear (Fig. 9.4.12).



**Fig. 9.4.12** Russian Knapweed (photo: U.S. Geological Survey)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.4.13** Rubber Rabbitbrush (*Ericameria nauseosa*)—ASTERACEAE. Woody shrub 18-72in high with many shreddy-barked flexible trunks from the base. Dense dull white to yellowish felt covers young branches. Somewhat sticky with resinous odoriferous gum. **Leaves:** Narrow, alternate, 1-3in long, less than 8mm wide, and covered with the same felt-like hair. **Flowers:** Narrow, heads 6-13mm long in rounded clusters at the ends of branches. Three to five rows of pointed bracts surround the 4-6 yellow flowers in each head. No outer ray flowers are present. **Seeds:** Slender achenes varying from smooth to tomentose and have pappus of dull white hairs. **a.** Flower head showing rows of bracts. **b.** Single flower. **c.** Stigmas (Fig. 9.4.13 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

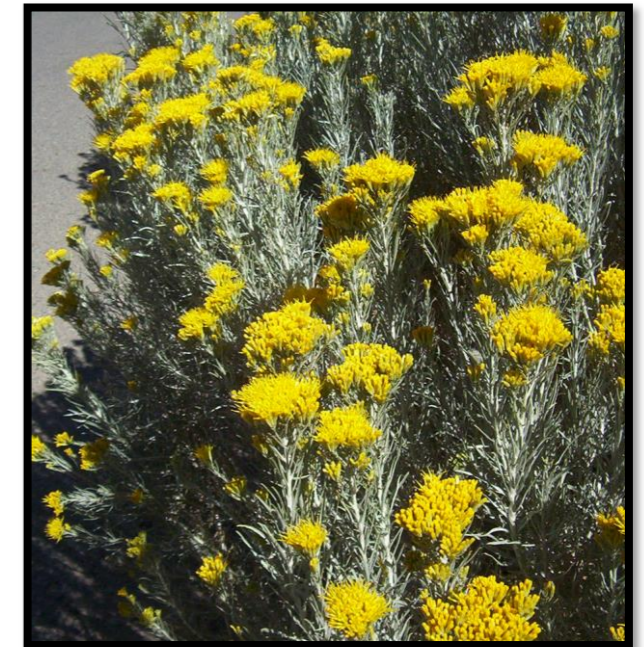
### Rubber Rabbitbrush (*Ericameria nauseosa*) [P|DN]

Rabbitbrush is a large beautiful native shrub of the western U. S. People have spread it to Asia, South America, and a few Pacific islands, but nowhere does it flourish as it does in North American deserts. Its silvery leaves and brilliant yellow flowers brighten whole landscapes during its fall flower show.

Cows eat portions of Rubber Rabbitbrush after they have consumed all the grass and other more desirable plants. When this happens, other weeds increase. Fuelweeds such as Cheatgrass (*Bromus tectorum*) are often among the increasers; they support increased fire frequency exceeding even the recolonizing ability of Rabbitbrush. After a few fires, only short-lived annual weeds remain.

This is a useful plant for restoring disturbed ground in arid environments. It is wildlife friendly, protects the soil, and requires little to no care (Fig. 9.4.14).

**Fig. 9.4.14** Rubber Rabbitbrush (photo © Fred Bauder)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



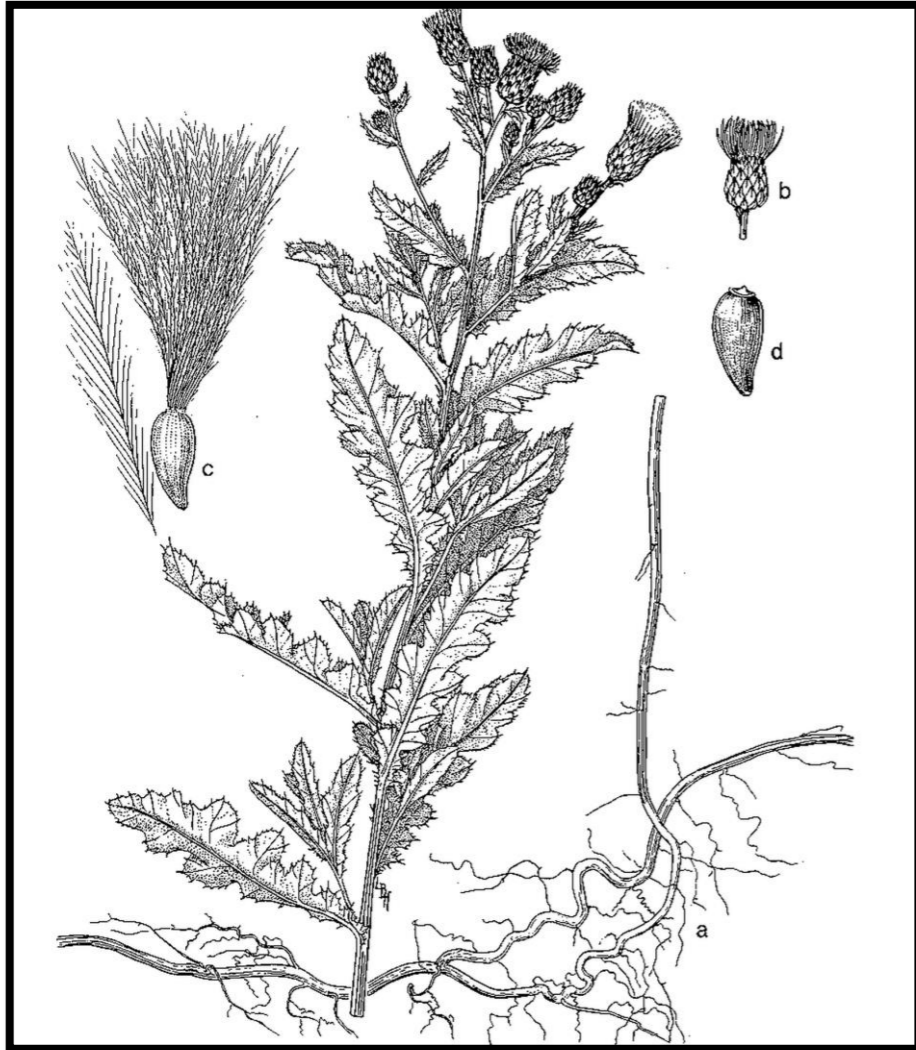
**Fig. 9.4.15** Macoun's Rabbit-Tobacco (*Pseudognaphalium macounii*)—ASTERACEAE. Bushy annual or biennial to 90cm tall with thin white distally tomentose stems. Flowers from July to October. **Leaves** alternate, 2-10cm long by 3-13mm wide. **Tiny flowers** numerous, yellow, in corymbs. **Seeds** in warty achenes (photo © GR)

**Macoun's Rabbit-Tobacco (*Pseudognaphalium macounii*) [A-B|DN]**

Rabbit Tobacco grows in scattered stands in North America from Canada to Mexico and from the Pacific to the Atlantic across an elevational range of 150 to 8500 feet. I do not know whether the plant has food or medicine values, and I haven't seen rabbits smoke or chew it. The plant is rare and might not be as aggressive as other natives such as Palmer Pigweed. The one plant I saw in 2018 did not reseed (Fig. 9.4.16).

**Fig. 9.4.16** Macoun's Rabbit-Tobacco flowers (photo © Max Licher)





**Fig. 9.4.17** Canada Thistle (*Cirsium arvense*)—ASTERACEAE. Plants 1-4ft high reproduce from seed and an extensive root system. Stems green and smooth. **Leaves:** Alternate, sessile, and clasping. Very spiny, lobed, to eight inches long and one inch wide. **Flowers:** 1-2cm wide, contain many small rose-purple tubular flowers. Bracts enclosing flower heads are spineless. Male and female flowers appear on separate plants (dioecious). **Seeds:** Bone or tan colored achenes 3mm long, oblong, smooth, with a tuft of feathery hairs remaining until maturity. **a.** Underground roots. **b.** Flower head. **c.** Achene with tuft of hair (Pappus). **d.** Mature achene without tuft of hair, shows blunt apex with central tubercle (Fig. 9.4.17 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

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### Canada Thistle (*Cirsium arvense*) [P|E|I|MT]

This Eurasian perennial is one of the most dreaded weeds in New World drylands. It grows in crops, fields, livestock ranges, and other disturbed areas. From those disturbed sites, Canada Thistle spreads into and replaces natural vegetation. The first Arizona record is from Flagstaff in 1920. By 1970, colonies had appeared across Coconino and Yavapai Counties.

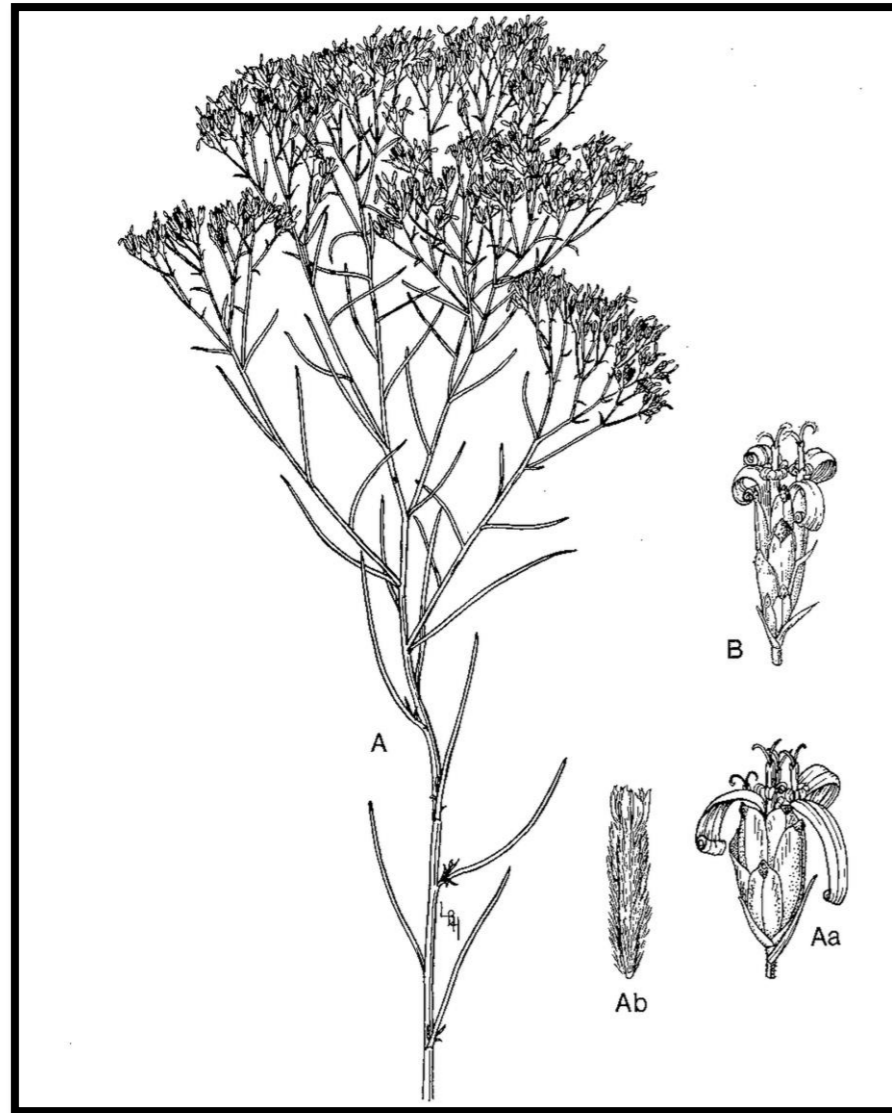
Though it is not a native, Canada Thistle is a food source for many insects and for Lesser Goldfinches. Parts of the plant are edible, and Wikipedia notes the Native American Cherokee used the feathery Pappus to fletch blowgun darts. These uses do not compensate for losing native vegetation to this alien invader.

Eradication of established colonies by mechanical means is difficult. I pulled aboveground shoots of a colony for 10 years without success. New shoots appeared throughout the growing season making it difficult to pull them quick enough to prevent energy transfer to the roots (Fig. 9.4.18).



**Fig. 9.4.18** Canada Thistle (photo © Pöldohakas)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.4.19** Broom Snakeweed (*Gutierrezia sarothrae*)—ASTERACEAE. Small shrub 6-24in tall. Many thin branching stems flowering at their tips. **Leaves:** Each stem has many thin leaves 1-4cm long. **Flowers:** At tips of branches, tiny bright yellow flowers appear summer through fall. **A.** Branches topped by clusters of tiny yellow flowers. **Aa.** Flower head 3-6mm long with 3-8 central flowers and 3-8 marginal flowers. **Ab.** Achene 1mm long with short Pappus. **B.** Narrower flower head of similar Threadleaf Snakeweed (*G. microcephala*) with 1-3 central flowers and 4-5 marginal flowers (Fig. 9.4.19 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### Broom Snakeweed (*Gutierrezia sarothrae*) [P|MN]

This common native weed is one of our leading protectors of damaged land. It appears along roads, powerline and pipeline corridors, and on overgrazed livestock ranges. Where livestock grazing removes plants and breaks up soil surfaces, Broom Snakeweed will perform its duty and cover the ground. Cows and sheep dislike the plant and Ranchers sometimes blame it for loss of productivity of the range. Nonsense. Snakeweed protects soils from wind and water erosion. If ranchers remove the cattle, other plant species will replace snakeweed in the normal way of plant succession. However, alien weed species introduced by people often interrupt normal succession. Some of them promote fire, replace Snakeweed, and prevent the return of native plants (Fig. 9.4.20).

**Fig. 9.4.20** Snakeweed  
(photo © Max Licher)





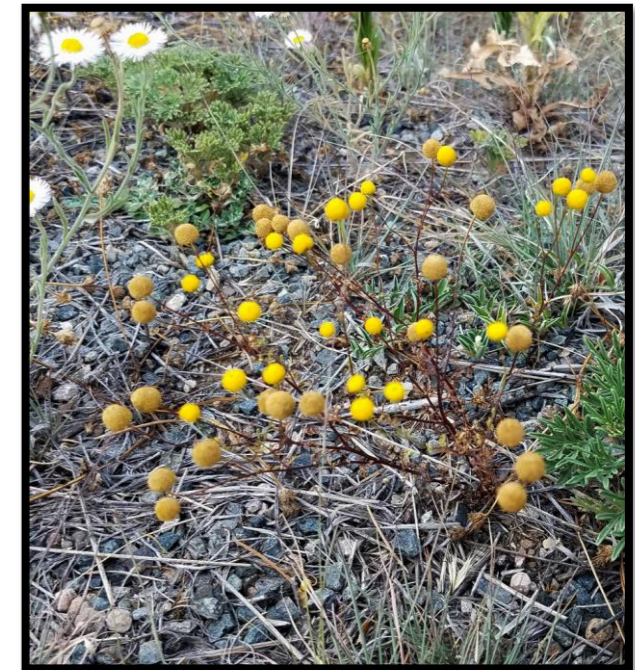
**Fig. 9.4.21** Stinknet (*Oncosiphon piluliferum*)—ASTERACEAE. Small shrub with bright yellow flowers. South African annual with persistent roots. Small, less than 2ft tall. One to five or more thin stems arising from base, sparse alternate **leaves** with glandular hairs, striking yellow **flowers** in small tight balls less than 10mm diameter. Fruit: Cylindrical smooth or ribbed achenes, resin-gland dotted face, less than 1mm long. Stinky (Fig. 9.4.21 photo © Max Licher)

### Stinknet (*Oncosiphon piluliferum*) [A|FIMT]

The first thought produced by Stinknet (also called Globe Chamomile) is its bright yellow flowers are attractive. The next thought for most people, however, is something stinks. Stinknet produces resinous aromatic sap that smells like a rotten pineapple. The odor plus the tendency for the plants to grow in tight formation impedes outdoor activity. Even worse, Stinknet is a strong competitor that replaces native plants. But worse still, the dry plants are flammable and encourage destructive wildfires. Once Stinknet invades, many soil organisms, native plants, and native animals disappear.

Stinknet is spreading across the hot deserts of California and Arizona. Botanists have not collected the plant above 2300 ft in Arizona, and I assumed at 4600 ft, D-H winters would be too cold for Stinknet. I did not even include it in the list of future weeds in *Weeds of Dewey-Humboldt, Arizona*. In June 2019, I found one Stinknet growing at 4600 ft beside Old Black Canyon Hwy near the center of D-H (Fig. 9.4.22).

**Fig. 9.4.22** Stinknet found growing beside Old Black Canyon Hwy (photos © GR)



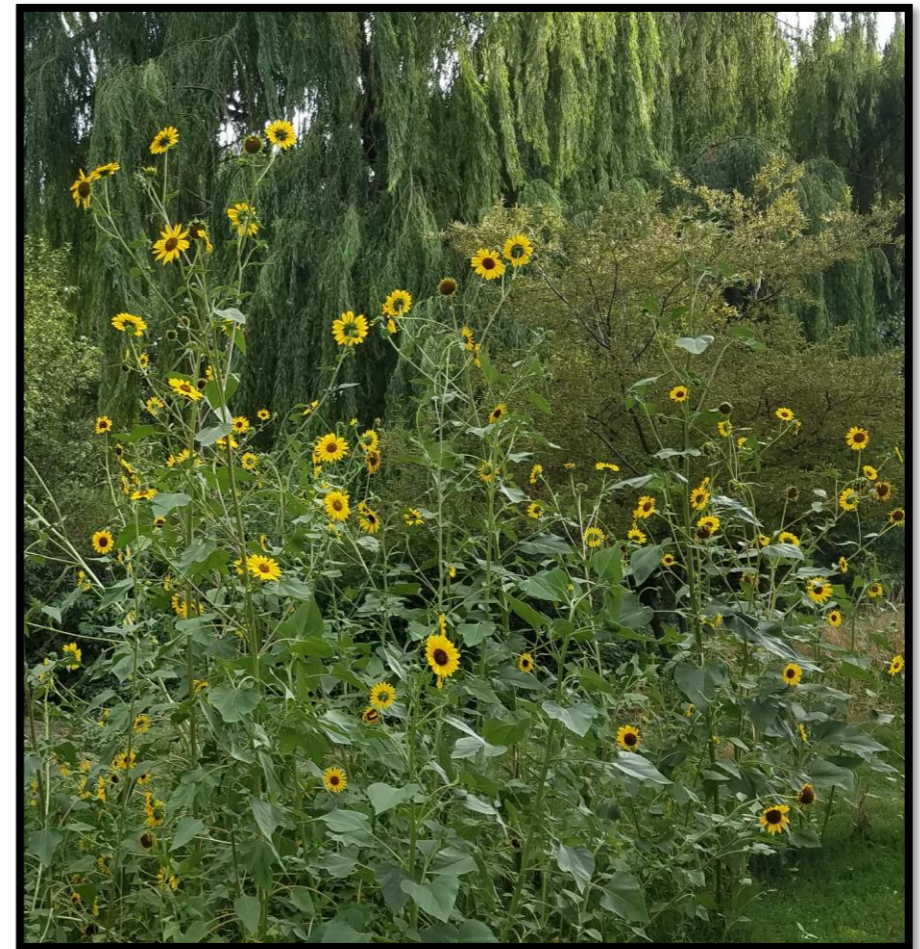


**Fig. 9.4.23** Sunflower (*Helianthus annuus*)—ASTERACEAE. Annual 1-4m tall reproducing only by seed. **Leaves:** Alternate, egg or heartshaped, toothed edges, pointed, 2-14in long, and 1-7in wide. **Flowers:** Yellow ray or marginal petals 2-5in wide surround many small female disk flowers that produce the achenes. **Seeds:** Achenes (shells) are 3-13mm long and 3-8mm wide, dark gray with black spots and pale stripes. **a.** The upper part showing flowers and leaves. **b.** Large basal leaf. **c.** Achene with dark spots and slightly hairy top (Fig. 9.4.23 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

### Sunflower (*Helianthus annuus*) [A|DEN]

Sunflowers are one of North America's most productive and beautiful weeds. They are present but not invasive in other arid regions. Essential for numerous wildlife species, the plant serves as host for at least three species of local butterflies: California Patch, Bordered Patch, and Painted Lady. Lesser Goldfinches and an occasional member of other species eat the leaves and seeds. Bees, butterflies, and other insects feed on the nectar and pollen. (Fig. 9.4.24).



**Fig. 9.4.24** Sunflowers (photo © GR)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.4.25** Telegraphplant (*Heterotheca grandiflora*)—ASTERACEAE. Annual 1-2m tall branching toward top like a telecommunications pole. **Leaves:** Hairy, basal rosette, smaller above. **Flowers:** Yellow 25-40 ray flowers 5-8mm long surround 30-75 disk flowers with 4-6mm corollas. **Fruit:** The disc and ray florets drop away to leave a spherical head of achenes (fruit), each with a long white pappus. Ray fruit 2-5mm, disk fruit 4-6mm (Fig. 9.4.25 photo © Forest & Kim Starr)

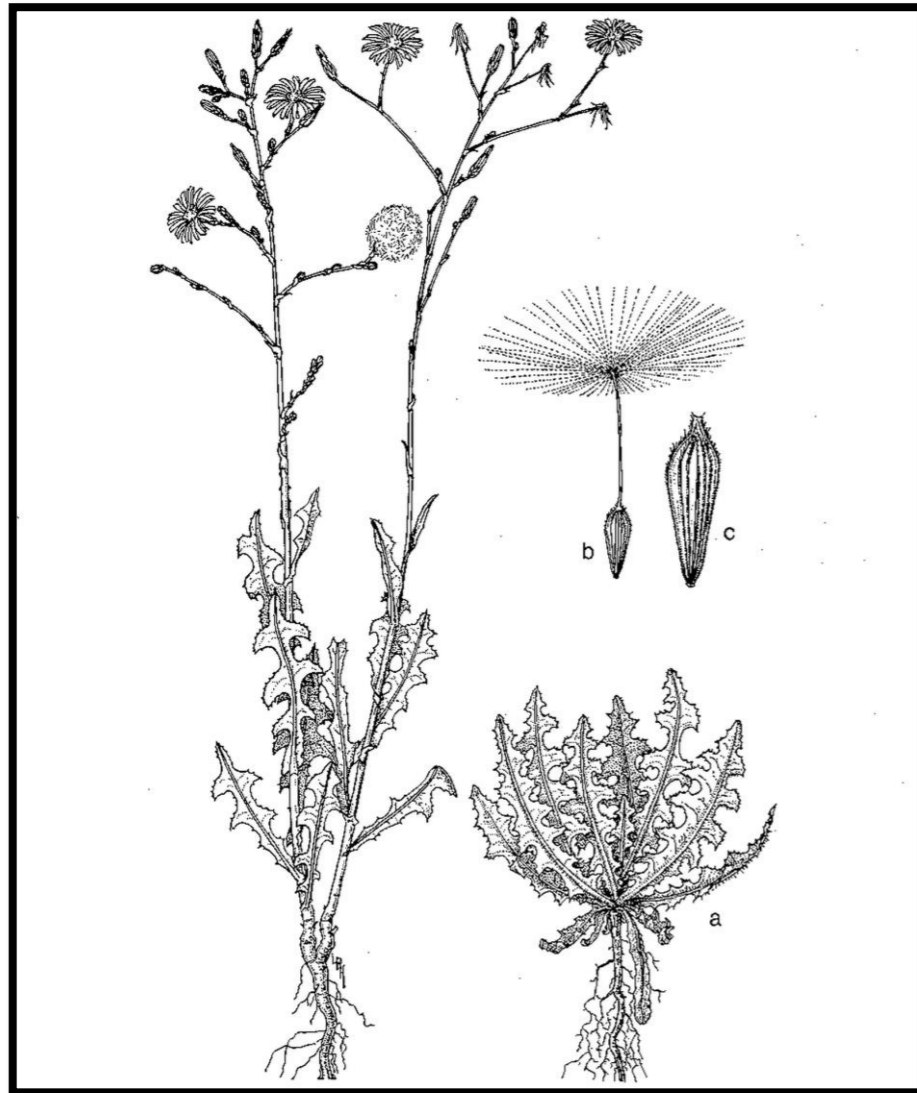
### Telegraphplant (*Heterotheca grandiflora*) [A|N]

Common around D-H, and present in the Sonoran, Mojave, and Great Basin deserts, Telegraphplant is not a difficult plant to control using standard mechanical techniques. Its flowers attract butterflies and other insects, making it desirable for wildlife. However, the plant is too rough and shaggy to appeal to flower gardeners (Fig. 9.4.26).

**Fig. 9.4.26** Telegraphplant (photo © GR)







**Fig. 9.4.27** Prickly Lettuce (*Lactuca serriola*)—ASTERACEAE. Annual or biennial 2-6ft tall with milky sap. **Leaves:** Alternate, blue green, stalkless, clasp stem with 2 earlike lobes. Lower leaves 2-10in long lobed or unlobed with prickles along edges, the large white midvein, and other veins underneath. Upper leaves smaller and unlobed. **Flowers:** Yellow heads 3-8mm wide on short stalks and composed of ray flowers. **Fruit:** 6-30 flattened light gray eggshaped achenes about 3mm long. **a.** Basal rosette of young plant. **b.** Achene with its parachute of hairs. **c.** Enlarged achene with linear ridges and short bristles near top (Fig. 9.4.27 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

### Prickly Lettuce (*Lactuca serriola*) [AB|MT]

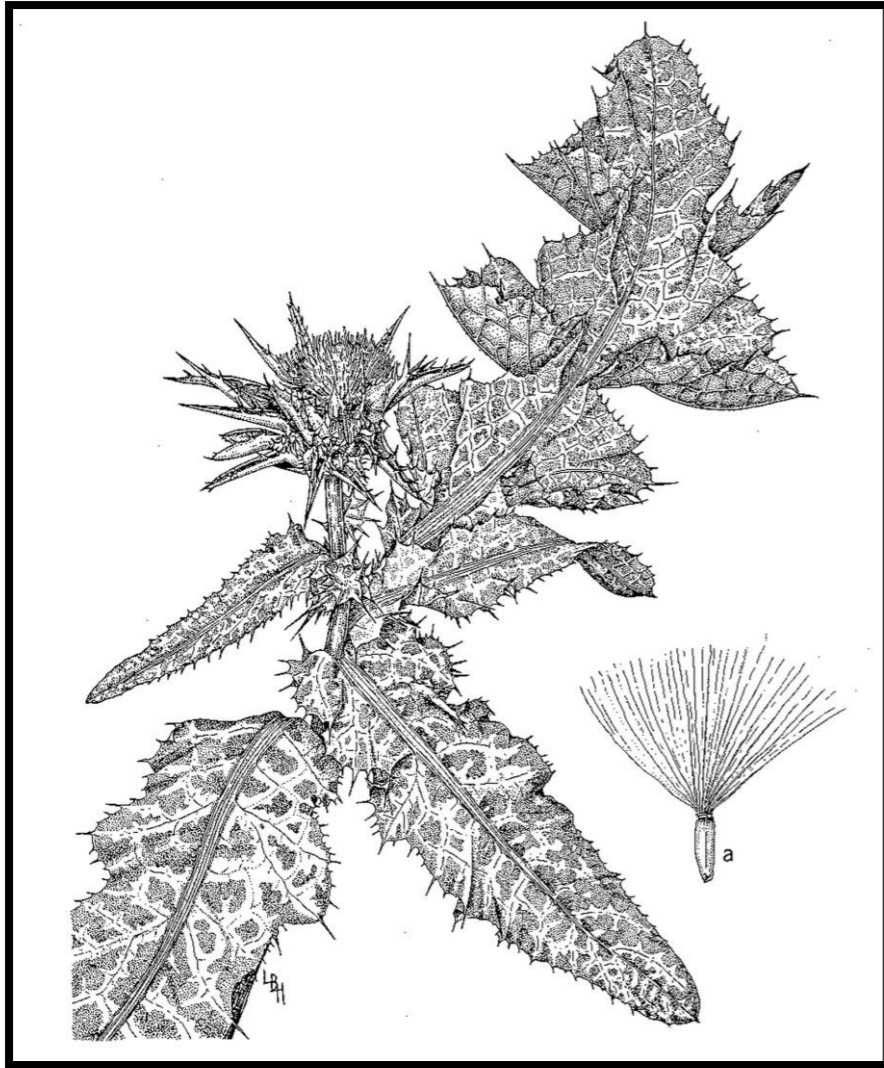
This Eurasian annual is a cosmopolitan troublemaker familiar to every gardener worldwide. Though the plant's leaves are edible when young and tender, they can't compare to Collards, Kale, or Spinach. The plant is a persistent pest during the summer, but a sharp hoe before the plumed seeds form will prevent a full-scale outbreak.

Numerous insect species spend time on Prickly Lettuce flowers and foliage. I haven't found reference to any local bugs or butterflies that prefer it to other plants, but the possibility exists (Fig. 9.4.28).

**Fig. 9.4.28** Prickly Lettuce  
(photo © Jeantosti)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.4.29** Milk Thistle (*Silybum marianum*)--ASTERACEAE. Hefty biennial 2-5ft high reproduces by seed. **Leaves:** Lower, lobed, stalked 1-2ft long. Upper, progressively shorter and less lobed. Two earlike lobes clasp the stem. Edges with many short yellow spines, midvein with white lines, and surface with scattered white patches. **Flowers:** Dense heads of red-purple, tubular flowers with five long narrow lobes. Leathery bracts around each flower head in several overlapping tiers, spine-margined, tipped by stiff spines 1-4cm long. **Seeds:** Achenes shiny, mottled buff and brown about 6mm long. Each bears a tuft of white scaly bristles (a) (Fig. 9.4.29 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### Milk Thistle (*Silybum marianum*) [B|EM]

Milk Thistle is a Mediterranean introduction rare around D-H. It is more common in the Arizona Upland subdivision of the Sonoran Desert below 3500ft. Not restricted to dry lands, the species appears in moist coastal areas and in the southeastern Great Plains of North America (Fig. 9.4.30).



**Fig. 9.4.30** Milk Thistle (photo © Flagstaffotos)



**Fig. 9.4.31** Bull Thistle (*Cirsium vulgare*)--ASTERACEAE. This big thorny biennial matures when 1-10ft tall. It forms a leaf rosette and a deep taproot the first year and a flowering stem the second. The stem has several spine-tipped wings along its full length. **Leaves:** spined margins, gray-green, and lobed. Rosette leaves are 6-10 inches long; upper leaves are smaller. **Flowers:** Inflorescence is 1-2 inches wide. **Seeds (c)** are about 1cm long. (Painting in: *Flora Batava* vol. 4, (1822) Public Domain)

### **Bull Thistle (*Cirsium vulgare*) [B|EM]**

This large Eurasian introduction is unpalatable for most livestock, but not rabbits and other small rodents including our local pocket gophers. The flowers are a favorite of bees, butterflies, and other insects. Goldfinches eat the seeds.

Bull Thistle is easy to eradicate if desired. It reproduces by dispersing seeds not by sprouting from roots. Use a sharp shovel to cut the root top below the basal leaves before seeds mature. The plants often recover, but one shoveling per year is usually enough to starve the roots until they die.



Young stems and roots are edible and there are medicinal uses (Fig. 9.4.32).

**Fig. 9.4.32** Bull Thistle (photo: USDA)



**Fig. 9.4.33** Spiny Sowthistle (*Sonchus asper*)—ASTERACEAE. Hollow stemmed annual 1-4ft tall. **Leaves:** Alternate with deep lobes and soft prickle-toothed edges. Lower leaves to 12in long, stalked with 5-11 lobes on each side. Mid and upper leaves not stalked, clasp the stem with large round lobes. Highest leaves not lobed. **Flowers:** Numerous 1-3cm wide made up of yellow petallike ray flowers. **Seeds:** Achenes reddish-brown, flat, ringed with a narrow wing, oval, 2-3mm long with three ribs. Several achenes held together by the tangled hairs (6-10mm long) of the pappus. **a.** Leaf with earlike clasp lobes. **b.** Flower. **c.** Achene (Fig. 9.4.33 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

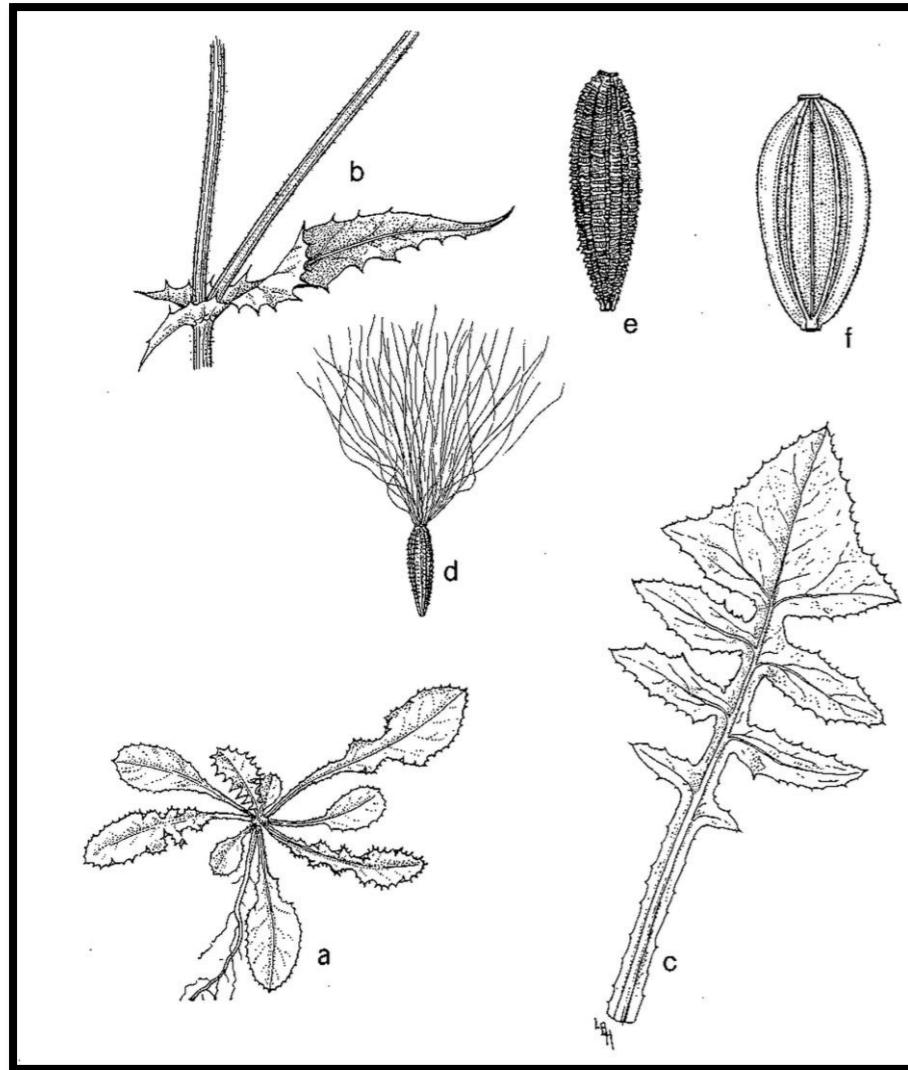
### Spiny Sowthistle (*Sonchus asper*) [A|ET]

An Old World introduction to North and South America, Spiny Sowthistle is a tireless colonist of roadsides, lawns, gardens, fields, and other disturbed sites. The plants' hollow stems make them vulnerable to any form of mechanical control such as a swift kick to the base. Easy to remove, but difficult to eradicate, the plants spring from pappused (bristled) achenes spreading on spring breezes every year (Fig. 9.4.34).



**Fig. 9.4.34** Spiny Sowthistle Dandelion-like flowers (photo © Matt Lavin)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.4.35** Annual Sowthistle (*Sonchus oleraceus*)--ASTERACEAE. Single stem to six feet tall. *Marginal prickles on leaves are smaller than those of Spiny Sowthistle above.* a. Main leaves of young plant showing large, one to three lobes, and a triangular-shaped tip lobe. b. Leaves clasp stem with two sharp projections. c. Stalked basal leaf. d. Achene with tuft of fine hair. e. Achene with five to seven indistinct ribs and strong cross wrinkling in furrows between ribs. f. *Achene of Spiny Sowthistle for comparison* (Fig. 9.4.35 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### Annual Sowthistle (*Sonchus oleraceus*) [A|ET]

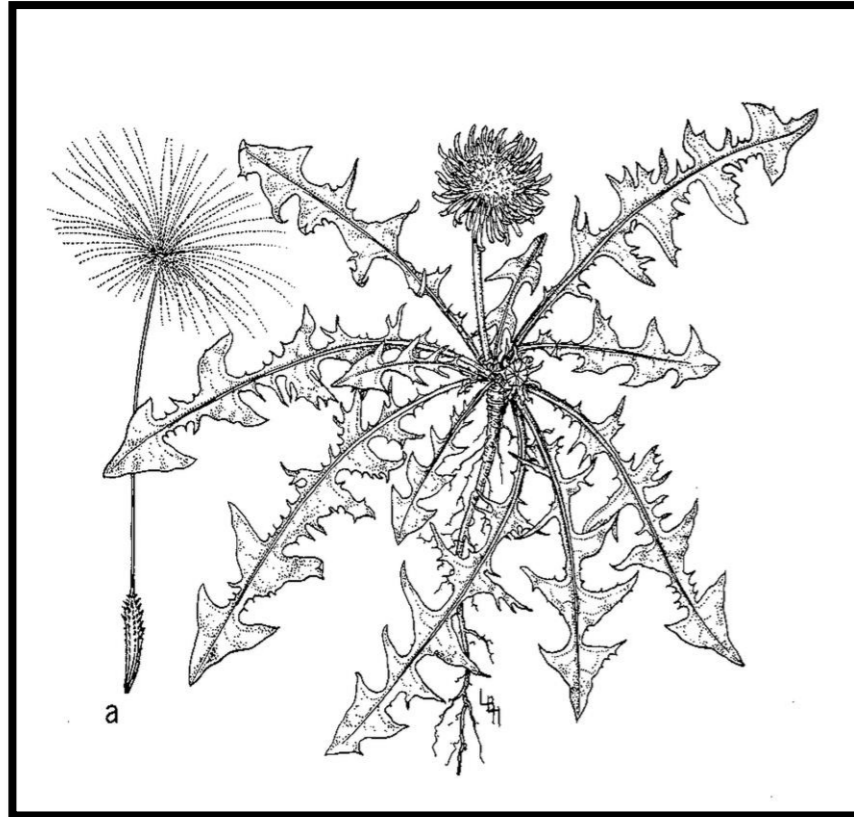
Annual Sowthistle resembles Spiny Sowthistle but its leaves don't look so dangerous. The toothy leaves of both plants are scratchy, but they are too thin to do much damage. The plant's stem is hollow leaving the whole business vulnerable to a swift kick.

A native of Europe and North Africa, Sowthistle is common in D-H often appearing on lawn and garden margins and poking up between other plants. Achenes with tufts of fluffy white hairs soon replace the spring and summer blooms. The plants are easily pulled or mashed when they appear in spring (Fig. 9.4.36).

Fresh Sowthistle leaves are bitter but become mild when blanched or boiled. They contain desirable nutrients and high protein content.



**Fig. 9.4.36** Annual Sowthistle (photo © Alvesgaspar)



**Fig. 9.4.37** Dandelion (*Taraxacum officinale*)—ASTERACEAE. A short perennial with deep roots that forms new shoots on root crowns. **Leaves:** Clustered in a rosette at the base of the plant, sometimes upright. Variable length 2-12in, lobed with pointed tips. **Flowers:** Solitary heads 1-2in wide composed of 40-100 ray flowers with five notches in the tip. **Seeds:** Achenes green or light brown, about 3mm long, with 5-8 ribs on each side and minutely toothed with tiny curved spines on upper margins. The achene has a tuft of fine white persistent hairs. **a.** Achene with hair wind sail (Fig. 9.4.37 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### Dandelion (*Taraxacum officinale*) [P|EM]

This may be our most familiar and beloved alien weeds. Found worldwide in temperate latitudes (not too dry, wet, or cold), Dandelion is from Europe, brought to the U. S. by early travelers. Watson (1871) reported the plant was growing in such isolated areas in the Great Basin (Utah-Nevada) he wondered if it might somehow be a native. Today, the consensus is people carried Dandelions with them from Europe to the New World, India, China, South Africa, Asia, and Australia. The plant's ability to disperse on the wind and establish in natural and human-caused disturbances let it spread across the new lands in a few years (Fig. 9.4.38).

Dandelion is difficult to eradicate without resorting to risky herbicides, but apart from a few crazed perfectionists, most of us are content to have a few make-a-wish puffs scattered across our lawns. Besides, this weed is a staple for many wildlife species and for humans. It goes into salads and stew pots, and we've all heard of Dandelion Wine. Moreover, the plant is probably the source of more botanical remedies for human ailments than any other species (Moore 2003).

**Fig. 9.4.38** Ripe seed head (photo © GR)





**Fig. 9.4.39** Crownbeard or Cowpen Daisy (*Verbesina encelioides* var. *exauriculata*)—**ASTERACEAE**. Grayish-green annual with a strong odor. Grows 1-4ft high. **Leaves:** Somewhat toothed, hairy beneath, and green above. Opposite lower leaves are narrow triangles 2-8in long including stalks. Upper leaves are alternate, shorter, often with a pair of leaflike lobes at the stem. **Flowers:** Heads on long stalks 2-5cm wide with 10-15 rays. Ray flowers are yellow, 8-13mm long with three notches at the top. Disk flowers are yellow and tubular. **Achenes** flattened, gray brown, about 6mm long with broad wings along margins. Two short awns arise on each side of the achene tip. **a.** Achene (Fig. 9.4.39 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

**Crownbeard or Cowpen Daisy (*Verbesina encelioides* var. *exauriculata*) [A|FMN]**

This North American annual forms thickets along roads after summer rains. It joins Common Cocklebur as one of the few New World plants colonizing the Old World. The species name, *encelioides*, means resembling *Encelia farinosa* a similar, yellow-flowered plant of the Sonoran Desert.

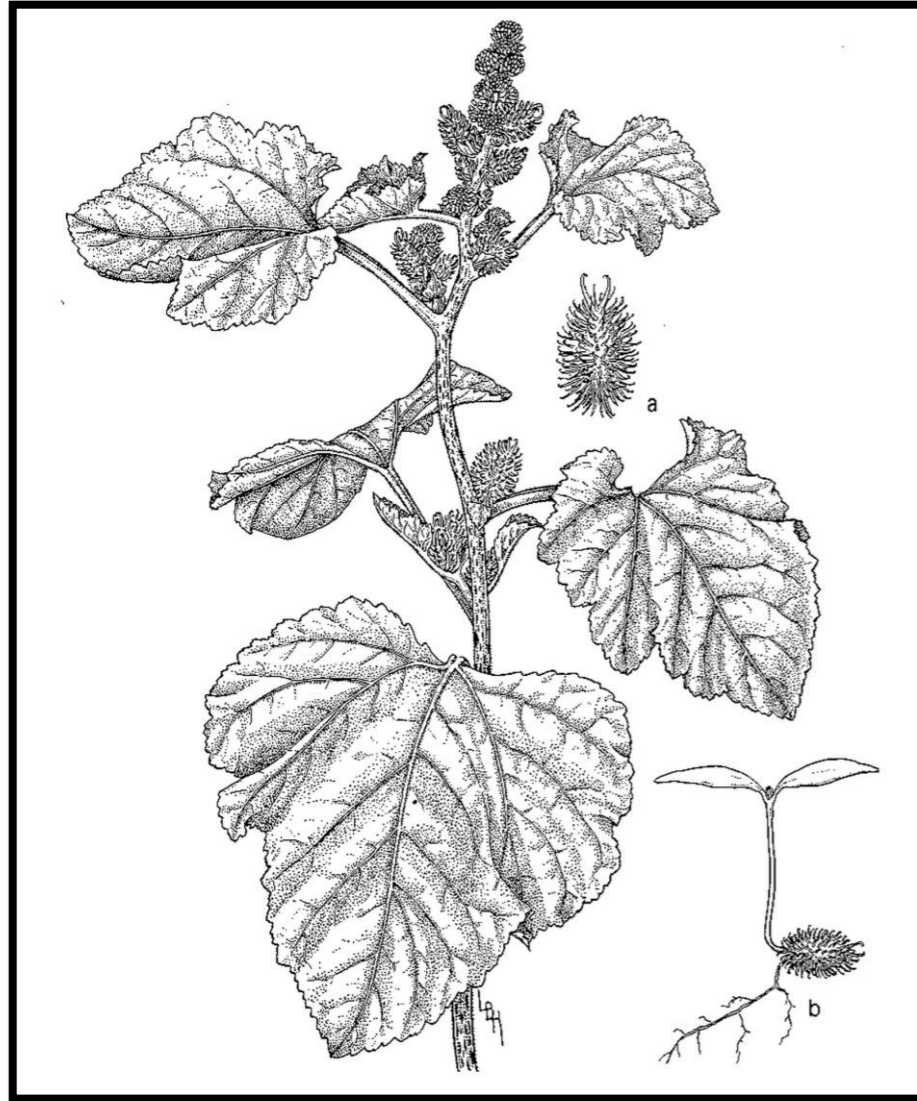
Crownbeard is allelopathic which means it produces biochemicals that block the germination and growth of other plant species. It can form dense stands with few other plants present. Crownbeard grows best in sunny locations and loses ground in the shade of larger plants.

Crownbeard attracts several species of flower moths. The caterpillars of at least one, the Aluring Schinia Moth (*Schinia siren*) feed exclusively on Crownbeard. I haven't found evidence of this moth in D-H, but that might be because of the small number of Crownbeard (Fig. 9.4.40).

**Fig. 9.4.40** Crownbeard  
(photo © GR)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.4.41** Cocklebur (*Xanthium strumarium*)—ASTERACEAE. Two to three feet high. **Leaves:** Longstalked triangular somewhat lobed leaves 2-14in long and 1-8in wide. The leaves feel like sandpaper. **Flowers:** Inconspicuous male flowers in round clusters at the top, conspicuous female burs below. Burs, 12-25cm long and covered by spines, enclose two female flowers. **Seeds:** Burs containing two blackish achenes are persistent. A pair of 13mm long seeds in each achene remain fertile for many years. **a.** Spiny female bur. **b.** Seedling emerging from bur (Fig. 9.4.41 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

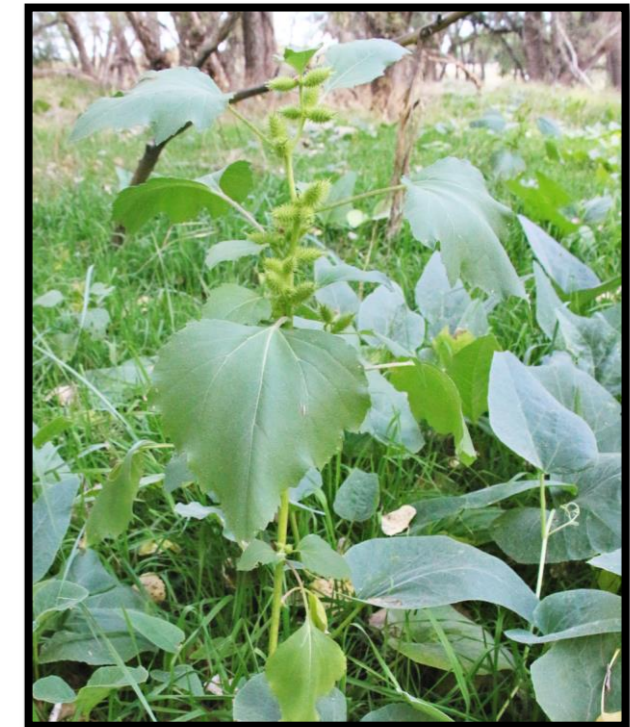
### Cocklebur (*Xanthium strumarium*) [A|MNT]

Native annual Cocklebur is one of the few New World weeds successful in the Old. It is present in southern Europe, south central Asia, southern South America, and elsewhere. The plants colonize irrigated fields and moist disturbed sites in washes, floodplains, and pond margins.

Flowers appear from April to July. The spiny pods with long hooked bristles are unmistakable. Dispersal is by water and furry animal. Mats in animal fur can persist until the next shedding cycle. The mats are troublesome in the fine fur of house cats and some dogs. The burs do not appear to be as persistent in the coarser hair of javelina and deer (Fig. 9.4.42).

Moore reports several medicinal uses for Cocklebur and says tea made by boiling two or three pods will stop the most obstinate diarrhea. However, too frequent use can be toxic for the intestinal track and liver (Moore 2003).

**Fig. 9.4.42** Cocklebur growing on the floodplain of the Agua Fria River (photo © GR)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]





**Fig. 9.4.43** Common Sagewort (*Artemisia campestris*)--ASTERACEAE. Aromatic herbs with 1-5 erect stems that grow to 5ft tall. **Stems and Leaves:** The stems are ribbed and brown with alternate pinnately divided leaves. **Flowers:** Tiny yellow flowers occur in spikelike panicles (Fig. 9.4.43 painting © Kurt Stüber, Public Domain)

Weeds of Dewey-Humboldt, Arizona

### Common Sagewort (*Artemisia campestris*) [BP|EMN]

Sagewort is a slender aromatic herb colonizing disturbed areas throughout North America, Europe, Africa, and Australasia. Several subspecies and variants have evolved across that wide range. The native species growing in D-H has a persistent basal rosette and is the only perennial subspecies of the group (Fig. 9.4.44).

People have long used the Artemisias for food, perfume, and medicine. SEINet describes some of the uses, and Moore covers many uses for other species of the genus.



**Fig. 9.4.44** Common Sagewort (photo © Matt Lavin)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.4.45** Musk Thistle (*Carduus nutans*)--ASTERACEAE. Annual solitary stems 30-200cm tall form dense stands. Stem with spiny wings from leaf bases. **Leaves:** Alternate, linear to elliptical, 10-40cm long and 5-200mm wide. Upper leaves smaller, smooth above, hairy beneath. Margins pinnately lobed and spiny toothed. **Flowers:** Heads 7-12mm long, disk flowers 20-40 appear July to October. **Fruits:** Achene 2-5mm long light brown, pappus bristles 11-13mm long and minutely *barbed*. Similar *Cirsium* species have pappus of softer unbarbed bristles (Fig. 9.4.45 - Amédée Masclef - Atlas des plantes de France. 1891. Public Domain)

Weeds of Dewey-Humboldt, Arizona

### Musk Thistle (*Carduus nutans*) [AB|FIT]

A European native, Musk Thistle is a serious threat to North American native vegetation. It colonizes disturbed sites along roads and across grazed fields. It spreads into surrounding vegetation and forms dense impenetrable stands in a variety of habitats and vegetation types. Botanists suspect multiple introductions of this thistle have produced multiple hybrids. This makes identification a little difficult. I haven't found the weed in D-H, but it is a likely future invader (Fig. 9.4.46).



**Fig. 9.4.46** Musk Thistle (photo © Kristian Peters)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



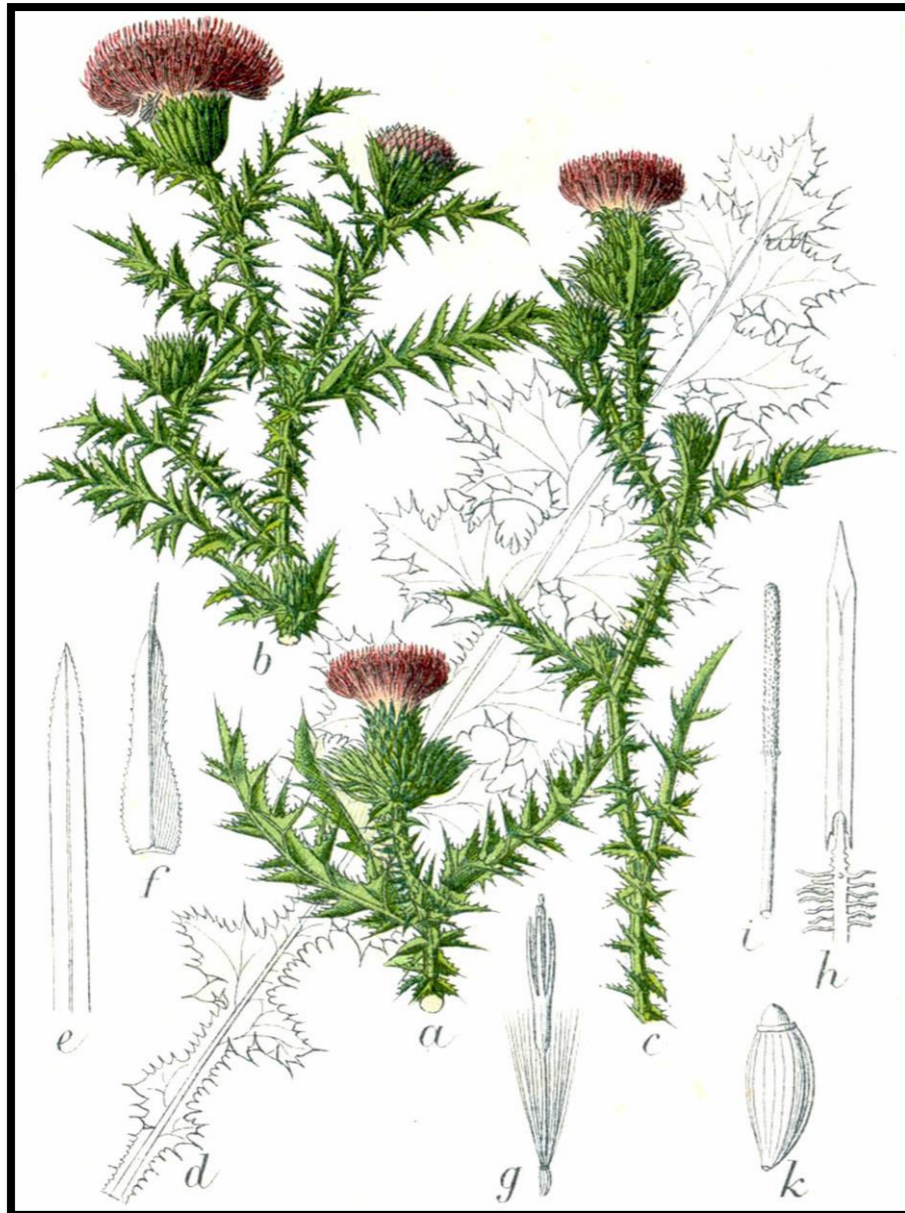
**Fig. 9.4.47** Oxeye Daisy (*Leucanthemum vulgare*)—ASTERACEAE. Perennial 10-100cm tall reproducing from seeds and from rhizomes; flowers spring to fall. **Leaves:** Basal leaves 12-50mm long, 8-30mm wide, 10-120mm stalks, toothed with 3-7 shallow lobes. Upper leaves 30-80mm long and 2-15mm wide some toothed and some without stalks. **Flowers:** Solitary at ends of branches, yellow disk 1-2cm wide, white rays 15-35mm long and 1-2cm wide. **Fruit:** Achenes with 10 ribs (Fig. 9.4.47 photo © Max Licher)

### Oxeye Daisy (*Leucanthemum vulgare*) [P|FI]

People often plant this Eurasian weed for its showy flowers. It is also an excellent source of nectar and pollen for bees, butterflies, wasps, flies, and other arthropods. In America, however, it can spread from gardens into native grasslands and form dense colonies. Cattle do not eat Oxeye Daisy, but their grazing and trampling create sites for it to colonize. Once established, it spreads by underground rhizomes. I do not know how the rhizomes respond to fire, but they can survive in soil scooped up in earthmoving operations. If they can survive fire, the plant could become one of our most troublesome weeds (Fig. 9.4.48).



**Fig. 9.4.48** Oxeye Daisy © Derek Ramsey



**Fig. 9.4.49** Welled Thistle (*Carduus acanthoides*)--ASTERACEAE. Biennial 30-200cm tall. Spiny wings extend down along stem from leaf bases. **Leaves:** Spiny toothed, alternate 10-40cm long, 1-20cm wide. Upper blades smaller, hairy underneath. **Flowers:** Several heads in panicle-like array, involucre 7-12 mm long, disk 4-8cm wide. Blooms July to October. Distinguished from similar species by having *minutely barbed bristles surrounding the flower*. **Fruits:** Achene 2-5mm long light brown, pappus bristles 11-13mm long. (Fig. 4.1.49 Photo © Jacob Sturm. 1796. Deutschlands Flora in Abbildungen)

Weeds of Dewey-Humboldt, Arizona

### Welled Thistle (*Carduus acanthoides*) [B|FI]

This Eurasian weed is widespread in the western U. S. Its plumed seeds dispersed by wind colonize disturbed sites across many types of habitats. I haven't identified it yet in D-H, but it is probably here (Fig. 9.4.50).



**Fig. 9.4.50** Welled Thistle (photo © ANRo0002)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.4.51** Scotch Thistle (*Onopordum acanthium*)—ASTERACEAE. Tall biennial (50-400cm), with tomentose spiny-winged stems and leaves. **Leaves:** Alternate, 10-60cm long, 2-15cm wide. Basal leaves with stems, upper leaves without stems but with wings that flow down along stems. **Flowers:** Heads solitary or numerous with 18-50 blue ray flowers. **Fruits:** Achene, 4-5mm long brown or black, pappus with many pink to red bristles. Plants produce 8,000 to 40,000 seeds. In Scotch Thistle, the receptacle or pedicel, the thickened part of the stem at the base of the flower, is honeycombed (Fig. 4.1.51 painting: Otto Wilhelm Thomé, *Flora von Deutschland*, Gera, 1885)  
Weeds of Dewey-Humboldt, Arizona

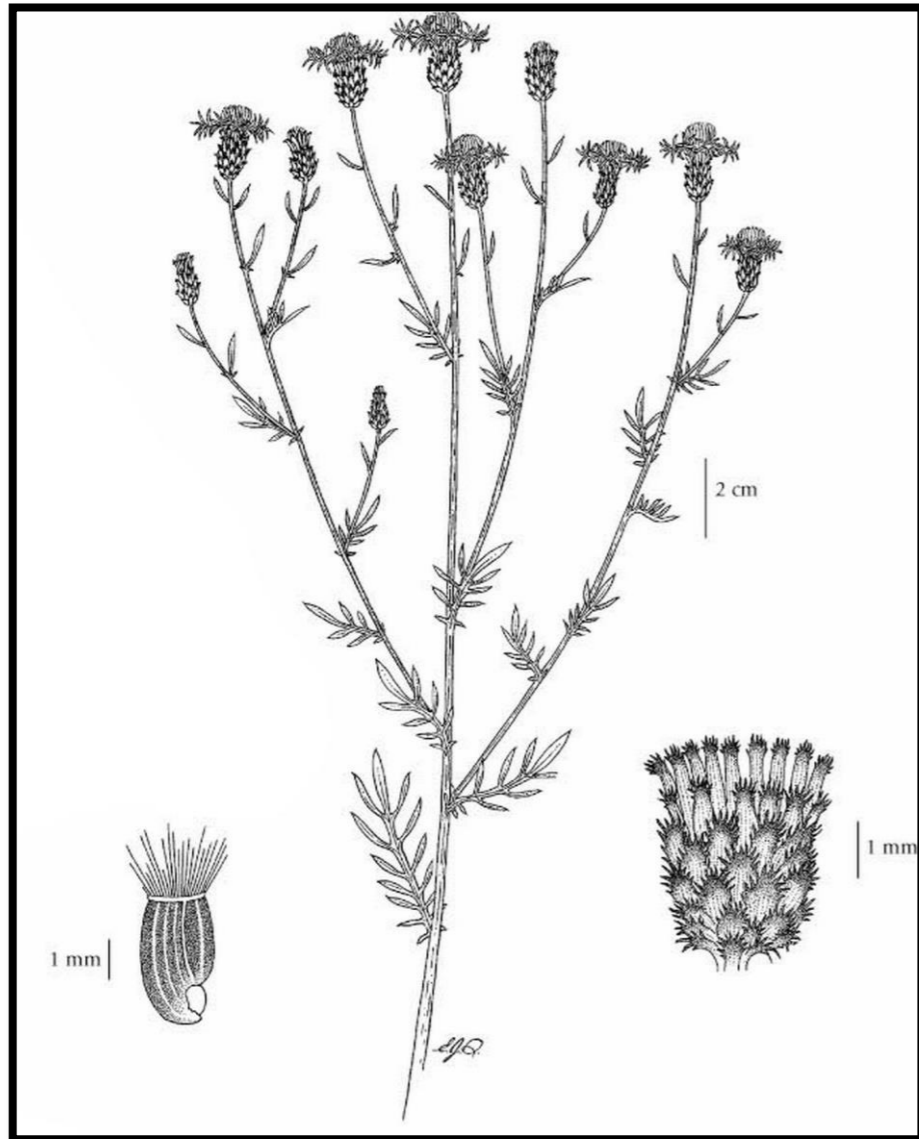
### Scotch Thistle (*Onopordum acanthium*) [B|ITZ-2]

Here's a challenge: My neighbor swore Goldfinches do not eat the seeds of this thistle, but I haven't been able to observe the plants long enough to decide this is true. However, if you have none, don't plant any; Scotch Thistle is so invasive and hard to eradicate, the State of Arizona has declared it a restricted noxious weed (Fig. 9.4.52).



**Fig. 9.4.52** Scotch Thistle (photo © Benutzer: Drahrub)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.4.53** Spotted Knapweed (*Centaurea biebersteinii*)—ASTERACEAE. Biennial 30-150cm tall. **Leaves:** Pale gray-green, pinnate, alternate, up to 6in long. **Flowers:** Purple-pink at branch tips, involucre 4-13mm. **Seeds:** Achene about 3mm long with bristly pappus. Inset left, achene with short pappus. Inset right, Involucre showing dark tips on middle and upper bracts. (Artist unknown. Internet image with no active links (Fig. 4.1.53). Searches across botanical artists produced the possibility the artist was Thomas Jenkinson Woodward, 1745-1820)

### Spotted Knapweed (*Centaurea biebersteinii*) [P|ITZ-2]

This eastern European weed merits the most stringent vigilance and eradication by hoeing and pulling. Its wind-blown seeds germinate in disturbed areas from whence it spreads into yards and gardens and native vegetation. It produces and disperses thousands of seeds, it develops a taproot that absorbs moisture faster than its neighbors, it produces toxic chemicals to inhibit neighboring plant germination and growth, and it develops foliage of low appeal to cattle. Sheep can eradicate this weed, but if you don't have sheep, get the hoe (Fig. 9.4.54).

**Fig. 9.4.54** Spotted Knapweed (photo © Matt Lavin)





**Fig. 9.4.55** Yellow Starthistle (*Centaurea solstitialis*)--ASTERACEAE. Annual, bushy, gray hairy plants to 1m tall. **Leaves:** Basal lobed 20-50cm, become smaller and unlobed with height on plant. **Flowers:** Yellow; involucre 10-15mm wide at base; middle and outer bracts with spines 11-22mm long. **Fruits:** Dark brown achenes 2-3mm long (Fig. 4.1.55 photo Peggy Greb, ARS, USDA)

Weeds of Dewey-Humboldt, Arizona

### **Yellow Starthistle (*Centaurea solstitialis*) [A|IPZ-2]**

With its impressive thorns and beautiful flowers, this foreign weed might tempt you to give it a spot in your yard. Not a good idea. Though the flowers attract butterflies, the plant is toxic to soil microorganisms and other plants, and both its roots and seeds are persistent. Mowing and burning often do not control the plant's spread. Herbivorous insects and competing plants keep it in check in its homeland in Eurasia, but in New World deserts, the controls are not present; it invades and replaces native vegetation (Fig. 9.4.56).



**Fig. 9.4.56** Yellow Starthistle (photo © Franco Folini from San Francisco)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.4.57** Stinking Chamomile (*Anthemis cotula*)--ASTERACEAE. Annual 5-90cm tall, green stems dotted with stinky glands. **Leaves:** Pinnately lobed 25-55mm long, 15-30mm wide. **Flowers:** Heads solitary; male and female flowers on separate plants; disk flowers only, yellow centers, white petals. **Fruit:** Achene 1-2mm long (Fig. 9.4.57 painting, Norman Criddle 1909)

### Stinking Chamomile (*Anthemis cotula*) [A|IM]

Also known as Dog's Fennel, this is not the plant used to make tea. Lots of insects visit the flowers, and some of the sources list medicinal properties. However, Moore doesn't cover it, so you will have to research the topic if interested in medical applications (Fig. 9.4.58).



**Fig. 9.4.58** Stinking Chamomile (photo © Max Licher)





**Fig. 9.4.59** Sweet Resinbush (*Euryops multifidus*)—ASTERACEAE. Bright green shrub to 1m tall. **Leaves:** To 2cm long, crowded near stem tips; some divided into narrow lobes about 1mm wide, fleshy and smooth. **Flowers:** About 1.5 cm wide, yellow ray and disc flowers on leafless stalks extend to 15cm from stem tips. **Seeds:** Hairy and when wet secrete a gelatin-like substance sticks to feathers, fur, machines, and clothing (Fig. 9.4.59 photo, U. S. Forest Service)

Weeds of Dewey-Humboldt, Arizona

### Sweet Resinbush (*Euryops multifidus*) [P|FITZ-2]

Sweet Resinbush (Fig. 9.4.60) poses a serious threat to native vegetation in North American deserts. It is a small shrub with a sticky substance on the branches. Hoping to have found a better cattle food than native plants, range scientists introduced it from South Africa in the 1930's. When cows refused to eat it, they abandoned the project. More than 30 years later, Sweet Resinbush began spreading.

"Why the concern over this shrub? Contrary to the intended goals of increasing forage for livestock and reducing erosion, sweet resinbush does the opposite. The plant encroaches into healthy grasslands, choking out native vegetation. It then forms a monoculture of resinbush with large amounts of bare soil, leading to increased soil erosion" (McReynolds 2008: 9).

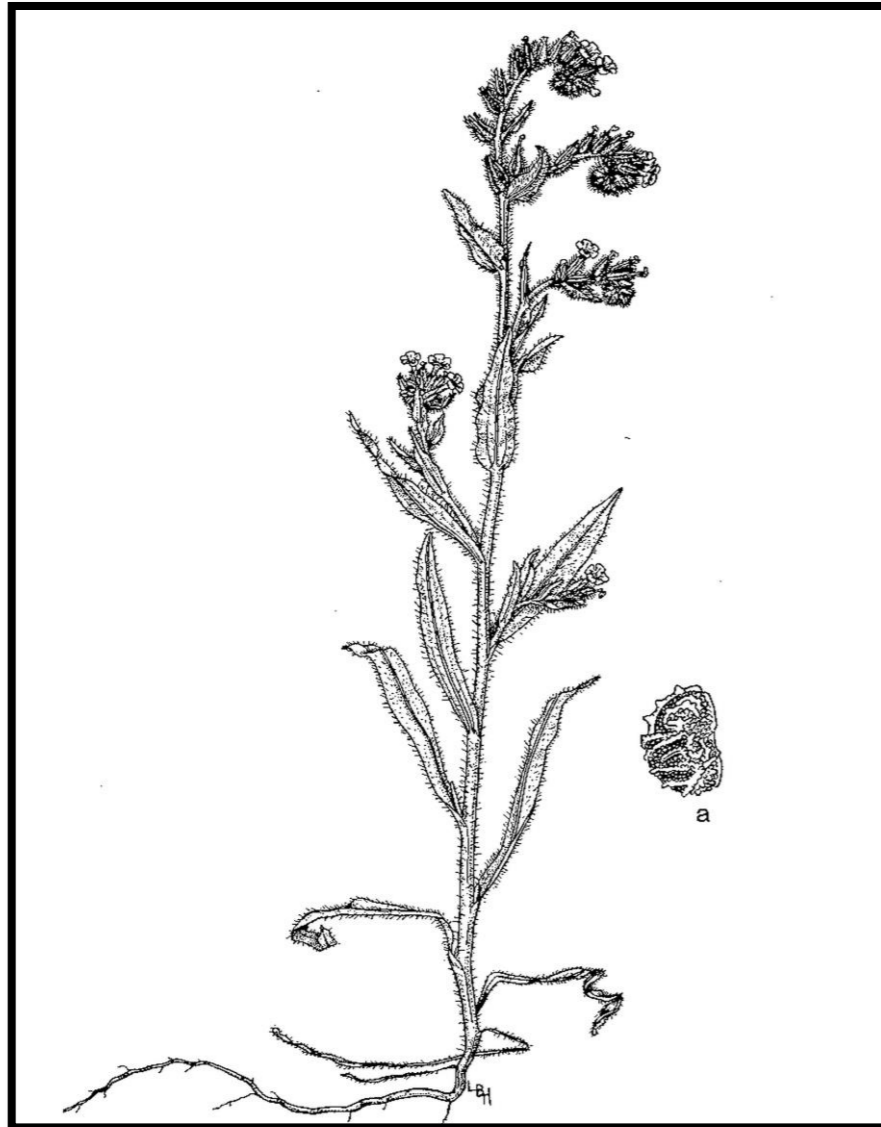
This plant is now growing near Prescott northwest of D-H and in the Agua Fria National Monument south of D-H. It could reach D-H soon.

**Fig. 9.4.60** Sweet Resinbush (*Euryops multifidus*) (photo © E. Makings)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]

## 9.5 FORGET-ME-NOT FAMILY—BORAGINACEAE



**Fig. 9.5.1** Coast Fiddleneck (*Amsinckia intermedia*)— BORAGINACEAE. Stiff harsh hairs cover the erect, branching stems 6-30in high and the 1-6in long leaves. **Flowers:** Slender yellow or orange-yellow, 9-13mm long, crowded on one side of the 3-10 inch long curling spikes. The bristly yellow five-lobed calyx encloses four gray nutlets containing one seed. **a.** Nutlet (Fig. 9.5.1 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

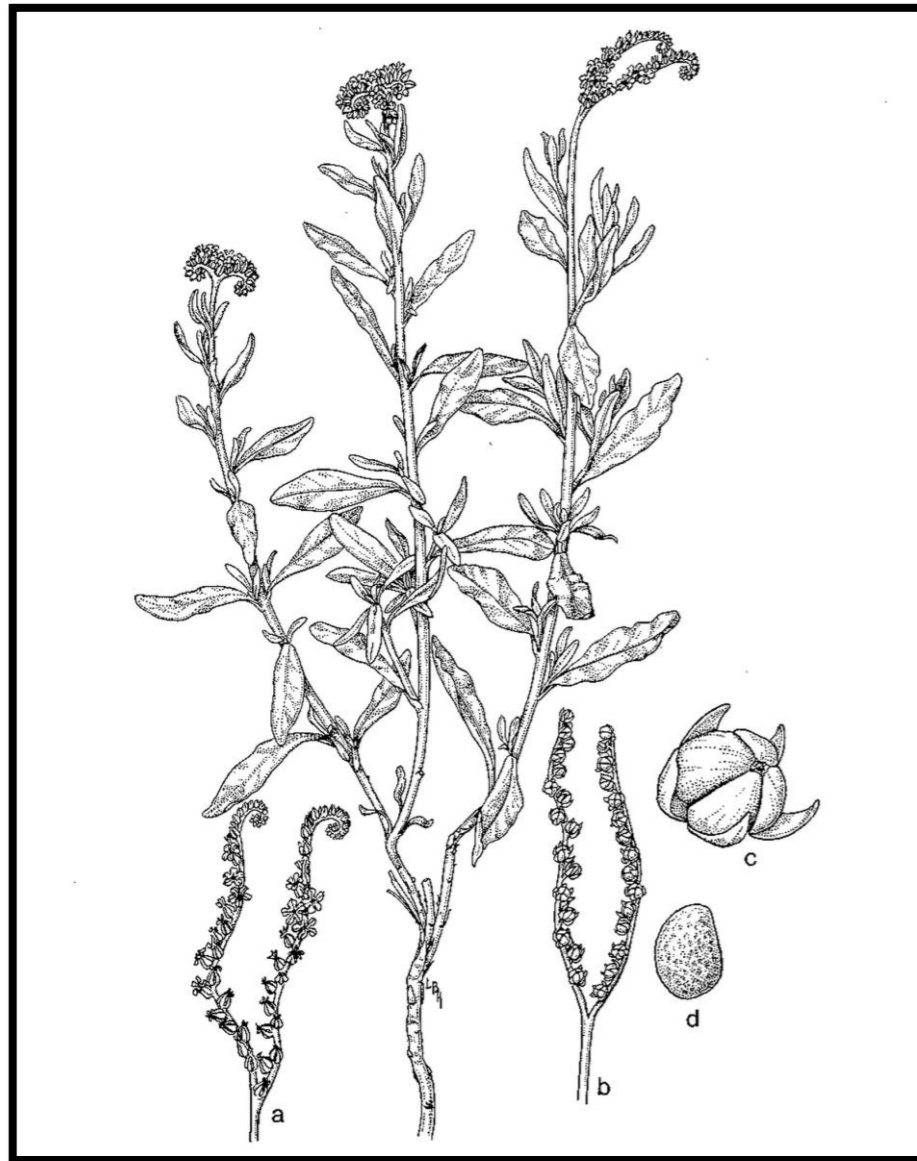
## Coast Fiddleneck (*Amsinckia intermedia*) [A|N]

This native annual weed appears in all the usual places: roadsides, gardens, and other disturbed areas. Mowing, hoeing, or pulling before seeds develop, will soon eradicate it. Despite all the hairs, animals eat Coast Fiddleneck and Gila River tribes ate the leaves after boiling, straining, and refrying them. The seeds are poisonous (Fig. 9.5.2).



**Fig. 9.5.2** Coast Fiddleneck (photo © Curtis Clark)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.5.3** Alkali Heliotrope (*Heliotropium curassavicum* var. *oculatum*)—BORAGINACEAE. **a.** Pair of flower spikes. **b.** Young fruits. **c.** Fruit composed of four small brown nutlets 1-2mm long. **d.** Single nutlet. Older flowers are at the fork of the uncoiling spikes (Fig. 9.5.3 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

**Alkali Heliotrope (*Heliotropium curassavicum* var. *oculatum*)**  
[P|DFN]

A native perennial, Alkali Heliotrope (AH) has tiny fragrant flowers that draw bees and gnats. The uncoiling flower-studded fiddleneck reveals tiny flowers with yellow-green eyes and pure white petals that darken to purple in sunlight. This low perennial grows to about one foot high in patches of overlapping branches up to four feet wide. The plants are hairless and dusted with white powder.

A native of arid North America, AH can edge into a lawn or garden. Removal by pulling is a simple cure. The plant has no thorns or burrs, and you might wish to leave it on unused sites where it will protect your soil from wind and water erosion.

The plants colonize exposed alkaline or saline soils and the banks of streams and washes in arid western U. S. and Baja California. You will find similar varieties around the world. I've seen this one growing beside a canal in Tempe, Arizona and a similar one beside limestone rocks near Fourteen Mile Creek in Oklahoma (Fig. 9.5.4).

**Fig. 9.5.4** Alkali Heliotrope flowers (photo © David Eickhoff)





**Fig. 9.5.5** Low Cat's Eye (*Cryptantha* spp.)—BORAGINACEAE. 2x. There are more than 100 species in the western U. S. They are quite variable and difficult to identify. These small low plants grow on dry gravelly or sandy soils. This low species is less than 5cm tall but spreads up to one foot in diameter. As most *Cryptantha*, the leaves and stems are quite hairy. The tiny white flowers appear in May and June and are only 2mm to 3mm in diameter. (Fig. 9.5.5 photo © GR)

Weeds of Dewey-Humboldt, Arizona

### Low Cat's Eye or Popcorn Flowers (*Cryptantha* spp.) [A or B|DN]

The *Cryptantha* I've seen in Dewey-Humboldt are all small and have tiny white flowers. The plant grows in the most hostile environment of bare gravel or sand in full sun. They can form mats of interlocked plants. As a first responder it deserves the highest honors, a critical pioneer blocking wind and water erosion and giving seeds of larger weeds a place to germinate.



**Fig. 9.5.6** *Cryptantha* flowers highly magnified. The hairy leaves and stems are typical of *Cryptantha* (Fig. 9.5.6 photo by Anthony Valois and the National Park Service, Public Domain)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]

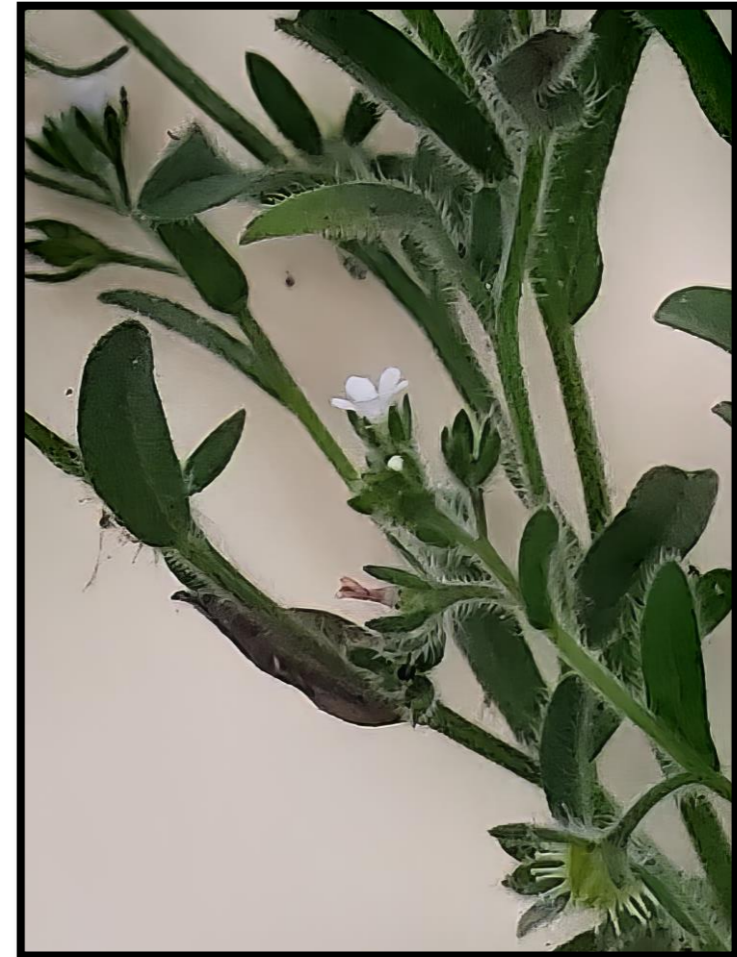


**Fig. 9.5.7** Erect Cat's Eye (*Cryptantha* spp.)—BORAGINACEAE. An erect species up to one foot tall and one foot in diameter. As with Low Cat's Eye, I'm unsure of the species. These plants grow on dry gravelly or sandy soils. The tiny white flowers are 2 to 3mm in diameter. (Fig. 9.5.7 photo © GR)

Weeds of Dewey-Humboldt, Arizona

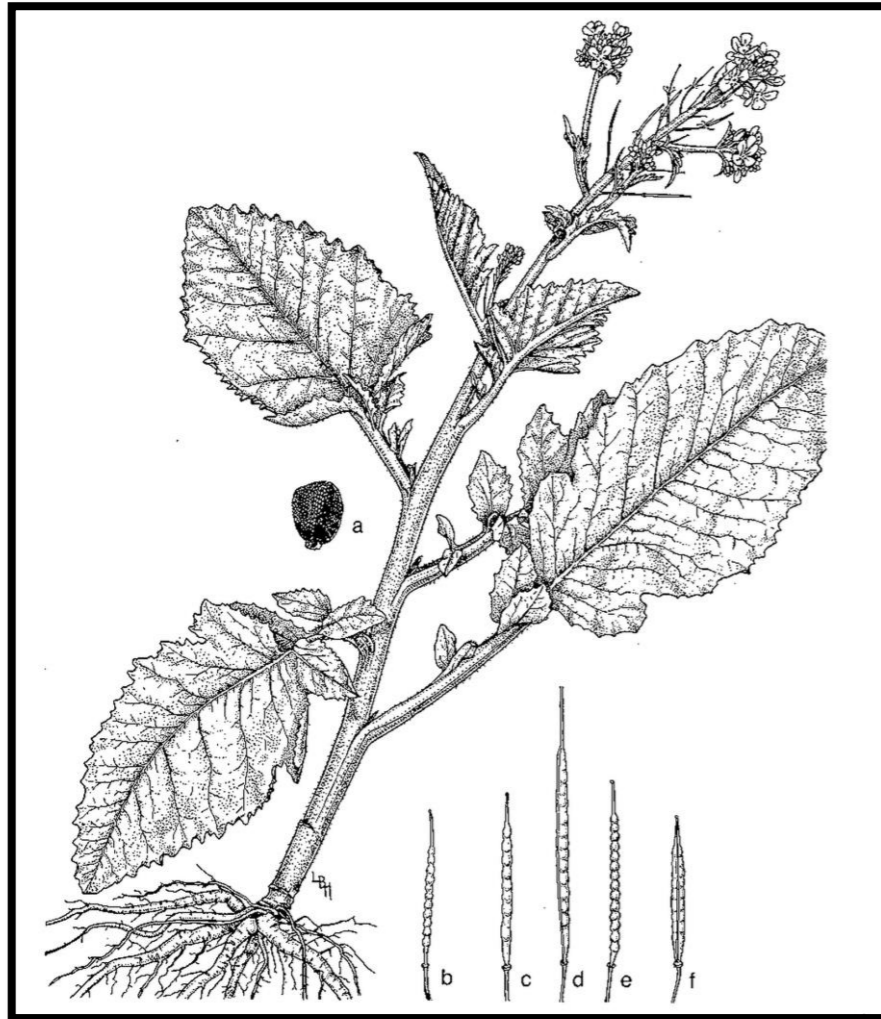
**Erect Cat's Eye or Popcorn Flowers (*Cryptantha* spp.) [A or B|DN]**

Appearing in May and June, the tiny flowers of *Cryptantha* attract small butterflies. The whole plant is small, and like Low Cat's Eye (Fig. 9.5.5 and 9.5.6) it occurs on the harshest surfaces.



**Fig. 9.5.8** Erect *Cryptantha* flower (Fig. 9.5.8 photo © GR)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.6.1** Black Mustard (*Brassica nigra*)—BRASSICACEA. Annual, 2-6 feet tall, reproduces by seed. Lower leaves are 4-16 inches long and have pairs of small lobes. Higher leaves are small, unlobed, and curled downward. Bright yellow flowers with four petals on the upper 1-2ft of the stem. The siliques (seedpods) are 9-19mm long at maturity and about 2mm wide on short stalks. Seeds are 1-2mm long and brown to black. **a.** Seed. **b.** Silique. **c.** Indian Mustard (*B. juncea*) silique. **d.** Wild Turnip (*B. campestris*) silique. **e.** Wild mustard (charlock) (*B. kaber*) silique. **f.** Rocketsalad (*B. eruca*) silique (Fig. 9.6.1 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### Black Mustard (*Brassica nigra*) [A|EI]

Black mustard originated in the Middle East, but farmers grow it worldwide to produce yellow table mustard. Its relative, Indian Mustard (*B. juncea*) is the source of brown or Dijon mustard. The leaves add tang to salads and steamed vegetables. Both mustard species will spread into other crops and along streams and ditches beside roads. Black Mustard is the most likely to appear in D-H (Fig. 9.6.2).

Checkered White (*Pontia protodice*), butterflies lay their eggs on this weed.

**Fig. 9.6.2** Black Mustard ripening siliques and flowers (photos © Pancrat)





**Fig. 9.6.3** Blue Mustard (*Chorispora tenella*)--BRASSICACEA: Annual, 2-24 inches tall, around seven stems upright or decumbent and branched. **Leaves:** Alternate, oblong, 1-13cm long. **a.** Groovy stem. **b. Flower**, lavender to bright purple (rarely white), petals narrow, 8-20mm long, sepals forming a deep purple tube. **c.** Six stamens with two shorter, style same length as filaments. **d. Silique** cylindrical, slightly curved, spreading, 12-25mm long (Fig. 9.6.3, Flora Batava 20, 1898)

Weeds of Dewey-Humboldt, Arizona

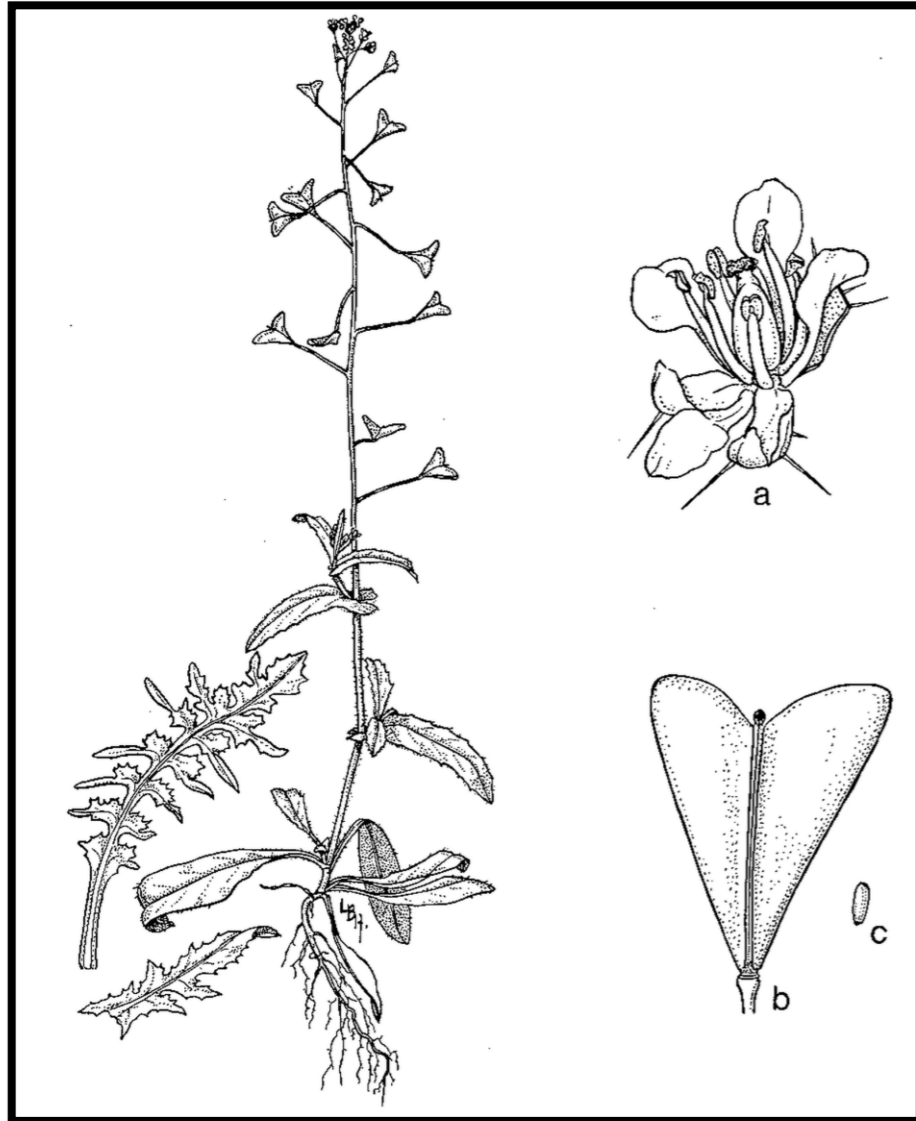
### Blue Mustard (*Chorispora tenella*) [P|IP]

This Asian annual is one of the most common weeds around D-H. It appears in early spring and soon fills the air with its 'perfume' which some people find repugnant. The plant forms large patches along our streets and sometimes it covers yards and vacant lots. Standing downwind of such a stand can produce a hint of nausea. Though the plant is small and produces no thorns or burrs, I consider it one of my worst weeds and give it the symbol **P**. Every year, I find, and pull the scouts around the house. That helps, but when the wind is right, the plants up the street fill my air with a fragrance not unlike burning plastic (Fig. 9.6.4).



**Fig. 9.6.4** Blue Mustard (photo © Stan Shebs)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.6.5** Shepherdspurse (*Capsella bursa-pastoris*)--BRASSICACEA. Annual 3-18in high, reproducing only by seed. Slender stems with long gray hairs. **Leaves:** Spreading rosette first to form. Rosette leaves toothed or lobed 4-8cm long including stalk. Stem leaves alternate, not lobed, pointed, stalkless, clasp stem with earlike lobe on both sides. **Flowers.** White, 2-3mm long on slender stalks. **Seeds:** In triangular silicles (seedpods with width less than three times length) notched with pointed base, about 6mm wide. Reddish or orange brown seeds are oblong, shiny, about 1mm long, grooved on each side. **a.** Flower. **b.** Seedpod. **c.** Seed (Fig. 9.6.5 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

### Shepherdspurse (*Capsella bursa-pastoris*) [A|M]

The distinctive triangular silicles of Shepherdspurse make identification as easy as it gets. The plant has a long flowering and fruiting season from spring to fall and some silicles will persist into winter (Fig. 9.6.6).

All mustard seeds are edible, but these are the best. However, the plant has strong chemical constituents making it unwise to eat more than a few of the fresh silicles. This caution does not limit Checkered White, Cabbage White, and Sara Orangetip butterflies using the plant to host their caterpillars.

**Fig. 9.6.6** Shepherdspurse painting by Norman Criddle



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]





**Fig. 9.6.7** Hoary Cress (*Lepidium draba*)--BRASSICACEA: Gray-green perennial 6-24in high reproduces by seed and sprouts from deep, spreading roots. Erect stems branch to form floral bouquets. **Leaves:** Broad, elliptical, 1-4in long. Lower leaves stalked, upper leaves stalkless, clasping stem with two lobes. **Flowers:** Tiny flowers on spreading stalks 6-13mm long have 3mm long petals. **Seeds:** Seedpods are almost hairless 3-6mm wide, tipped by slender beak. Two chambers produce one or two seeds 1-2mm wide. **a.** Lower leaf. **b.** Seedpod. Hairy White-top (next), is similar (Fig. 9.6.7 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

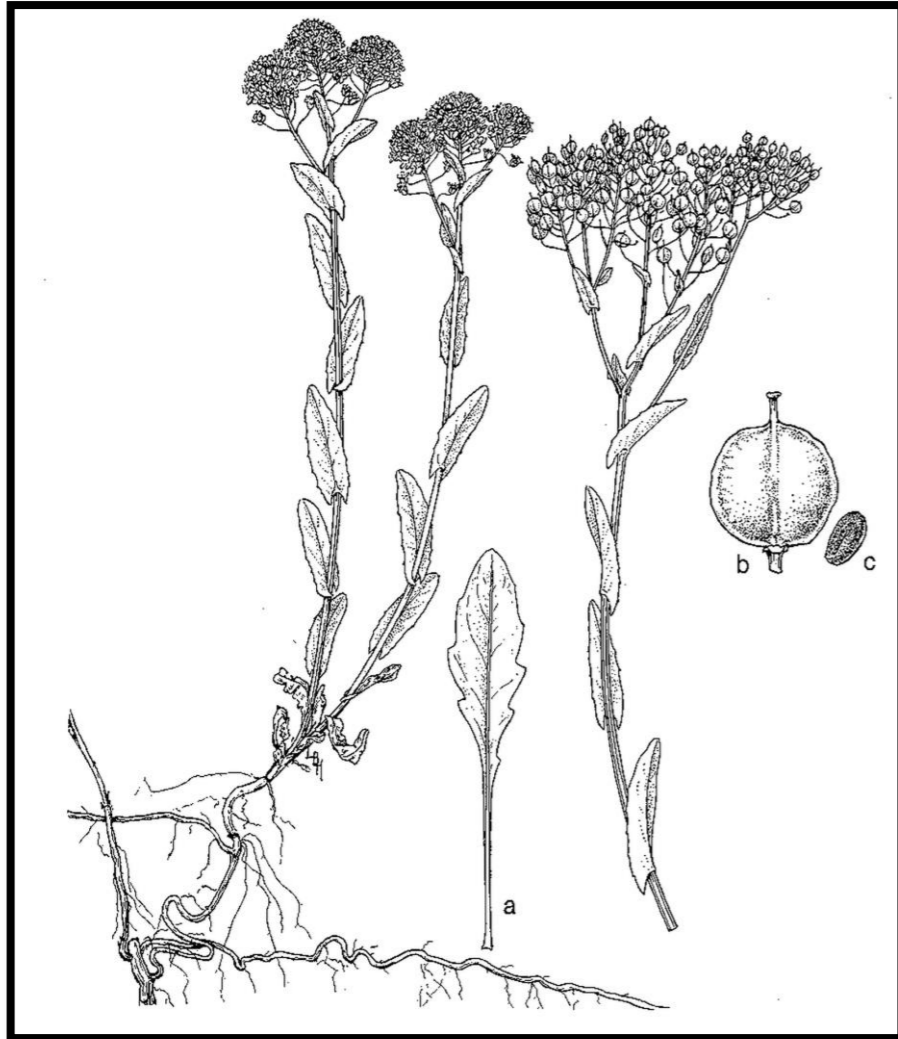
### Hoary Cress (*Lepidium draba*) [P|I]

This medium-sized alien perennial prefers the dry air of the desert. First collected in the U. S. on Long Island in 1862 (Groh 1940), Hoary Cress is abundant in the Rocky Mountain States and westward. The plant is rare in D-H.

People introduced Hoary Cress on Long Island and elsewhere as an ornamental. They also introduced it by accident when they imported contaminated Alfalfa seeds. The plant is most successful in the sagebrush vegetation of the northern Great Basin Desert. Part of its success is because of toxic chemicals in the roots. These saturate the soil around the plant and inhibit germination and seedling growth of other plant species. Hoary Cress can replace native vegetation (Fig. 9.6.8).

**Fig. 9.6.8** Hoary Cress  
(photo © Kraelj)





**Fig. 9.6.9** Hairy White-top (*Lepidium appelianum*)--BRASSICACEA: Gray-green perennial 6-24in high reproduces by seed and sprouts from deep, spreading roots. Erect stems branch to form floral boquets. **Leaves:** Broad, elliptical, 1-4in long. Lower leaves stalked, upper leaves stalkless, clasping stem with two lobes. **Flowers:** Tiny flowers on spreading stalks 6-13mm long have 3mm long petals. **Seeds:** Seedpods are almost hairless 3-6mm wide, about 8mm long and tipped by slender beak. Two chambers produce one or two seeds 1-2mm in size. **a.** Lower leaf. **b.** Seedpod shown is from the nearly identical Hoary Cress (*Cardaria draba*) (cf.). *Hairy White-top* seedpods are hairier than those of *Hoary Cress* (Fig. 9.6.9 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### Hairy White-top (*Lepidium appelianum*) [P|FI]

This Asian introduction was unknown in Arizona when Kitty Parker published her *Arizona Weeds* (Parker 1972). According to the Encyclopedia of Life, this Uzbekistan native was present on Long Island, New York in 1871. The plant did not spread to other eastern or Midwestern states. However, it is now present in the Rocky Mountains, Great Basin, and arid eastern portions of the West Coast states.

The plant is present in one location north of the Grand Canyon and in Skull Valley west of Prescott, Arizona. Botanists surveying the Agua Fria National Monument in 2007 found the plant and judged it a high threat for invasion. The Monument is about 20 miles south of D-H, close enough to expect any weeds there will soon be here.

The plant's absence in the Great Plains suggests it requires low humidity to thrive. We have that (Fig. 9.6.10).



**Fig. 9.6.10** Hairy White-top (photo © Meneerke Bloem)



**Fig. 9.6.11** Tansymustard (*Descurainia pinnata*)--MUSTARD FAMILY—BRASSICACEA. Annual reproducing only by seed. Pale gray due to covering of forked or starlike hairs. Some less hairy and green. Stems often purple. **Leaves:** Alternate, 1-4in long, divided into fine segments. **Flowers:** Pale yellow, 2mm long on short stalks which lengthen as siliques mature. **Seeds:** Short seedpods, 6-13mm long, on upper stems; contain two rows of dull red seeds about 1mm long with a groove on one side. The siliques are wider and rounder at the tip than the base (club-shaped), *siliques not constricted between the seeds*, pods point upwards. **a.** Portion of seedpod showing seed attachment. **b.** Seedpod. **c.** Seed (Fig. 9.6.11 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

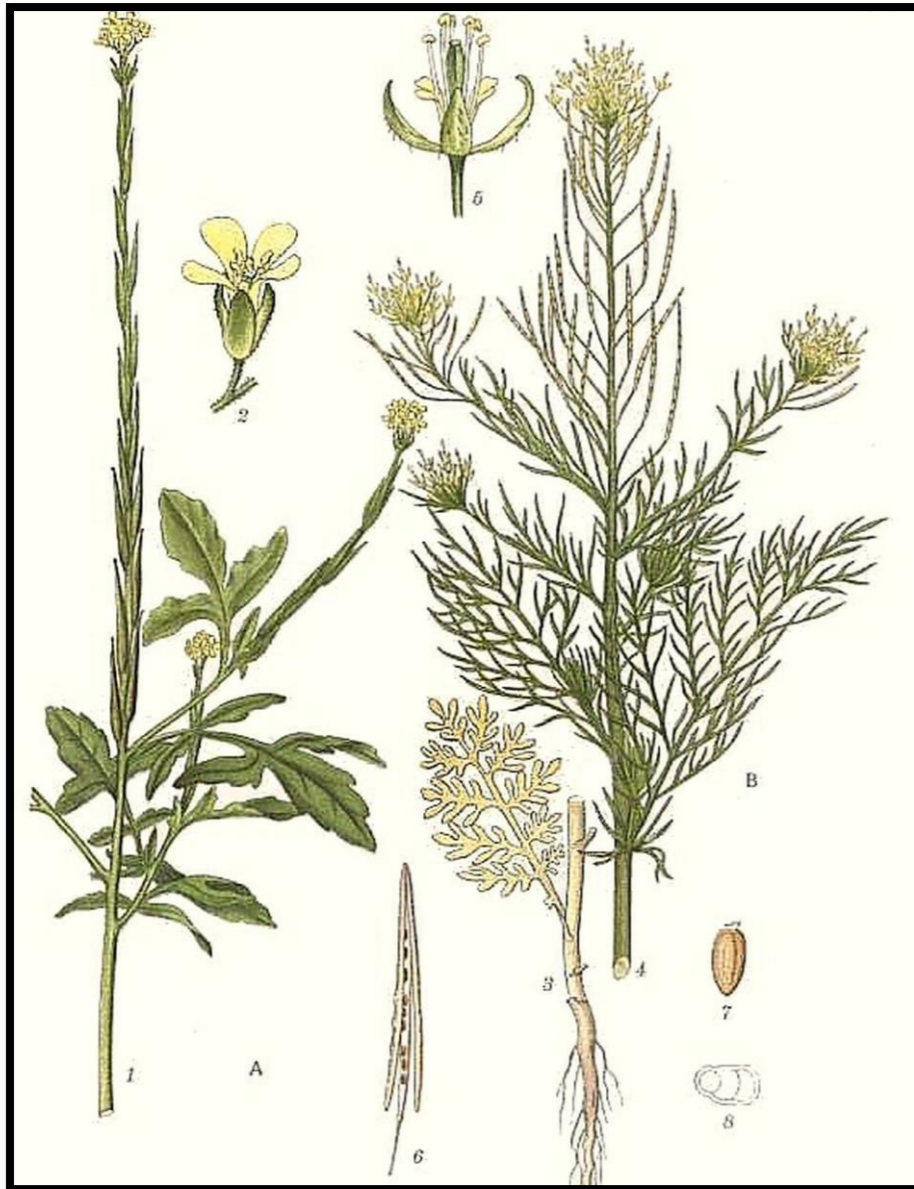
### Tansymustard (*Descurainia pinnata*) [A|EIN]

Though a native weed, Tansymustard (Fig. 9.6.12) poses great danger to native ecosystems. It combines with other weeds to increase fine fuel quantities and encourage increased wildfire frequency. If the interval between fires becomes too short, the native plants normally succeeding Tansymustard and other colonists cannot return. Perhaps this is only when other fuelweeds are present, perhaps not. I know of one instance where Tansymustard was the principal weed replacing an extensive Greasewood (*Sarcobatus vermiculatus*) community. The plant is abundant mixed with other weeds on Black Mesa in Agua Fria National Monument south of D-H. Over the past 50 years, Black Mesa fire frequency increased eliminating all native vegetation.

**Fig. 9.6.12** Tansymustard (photo © Curtis Clark)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.6.13** Flixweed (*Descurainia sophia*)--BRASSICACEA: Introduced annual 25-75cm tall. **Leaves:** Basal leaves with short stalks; stem leaves with no, or with short, stalks, alternate, 2-9cm long, 2-3 times pinnate. **Flowers:** Yellow, terminal racemes on 8-15mm long pedicels ascending in flower and spreading to descending when in fruit; four sepals ascending, yellowish, 2-4mm long; petals 2-3mm long. **Seeds:** Many brown 1mm long seeds in 1-3cm long, curved, ascending siliques constricted between the seeds. **3.** Basal stem and pedicel leaf. **4.** Stem. **5.** Flower showing curving sepals. **6.** Silique. **7.** Seed. (Fig. 9.6.13 painting: Lindman 1917-26)

Weeds of Dewey-Humboldt, Arizona

### Flixweed (*Descurainia sophia*) [A|I]

Flixweed is common across the western U. S. My original encounter with this weed occurred while researching historical vegetation changes in the Great Basin Desert. There, the weed was quick to arrive after a fire. Like Tansymustard (above), the plants dried out by early summer served as fuel to carry fires. Fire frequency increased, and in many places, none of the original vegetation remains (Fig. 9.6.14).



**Fig. 9.6.14** Flixweed forming a fine fuel matrix between shrubs two years after a fire (photo © Max Licher)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.6.15** Perennial Pepperweed (*Lepidium latifolium*)—BRASSICACEA. Rhizomatous perennial to 2m tall. **Leaves:** Lower leaves leathery on stalks 1-10cm, oblong, 10-30cm long and 2-8cm wide. Upper leaves smaller. **Flowers:** Petals white 2-3mm long, 1mm wide, six stamens. Blooms June to August. **Seeds:** Oblong, about 1mm in size (Fig. 9.6.15 Flora Batava 20, 1898)

### Perennial Pepperweed (*Lepidium latifolium*) [P|EFI]

This is another Eurasian weed spreading across North American Deserts. I have not yet seen it in D-H. Its most likely first appearance will be along the Agua Fria River since it prefers moist soil (Fig. 9.6.16).

Perennial Pepperweed can invade desert grasslands and shrublands. Since the shoots, leaves, and seeds are nutritious (boil, soak for two days, then treat like spinach) we could arrest this invader's spread with our home cookstoves.

**Fig. 9.6.16** Perennial Pepperweed (photo © Michael Becker)





**Fig. 9.6.17** Hairy-Pod Pepperwort (*Lepidium lasiocarpum*)—BRASSICACEA. Annual 1-15in tall, stems erect or prostrate, numerous, with short hair lying flat on surfaces, sometimes with longer hair. **Leaves:** 1-6in long, alternate, wider toward tip, toothed or lobed. **Flowers:** White petals less than 2mm long or absent supported by hairy pedicel. **Seeds:** Rounded seedpods notched at tip covered by short hair or by hair on edges, 3-16mm long by 3mm wide and contain two red, oval seeds. **a.** Flower. **b.** Seedpod with short hairs. **c.** Seed. Subsp. *wrightii* seed pods have pustular-based hairs, and subsp. *lasiocarpum* seed-pod hairs are not pustular based. (Fig. 9.6.17 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)  
Weeds of Dewey-Humboldt, Arizona

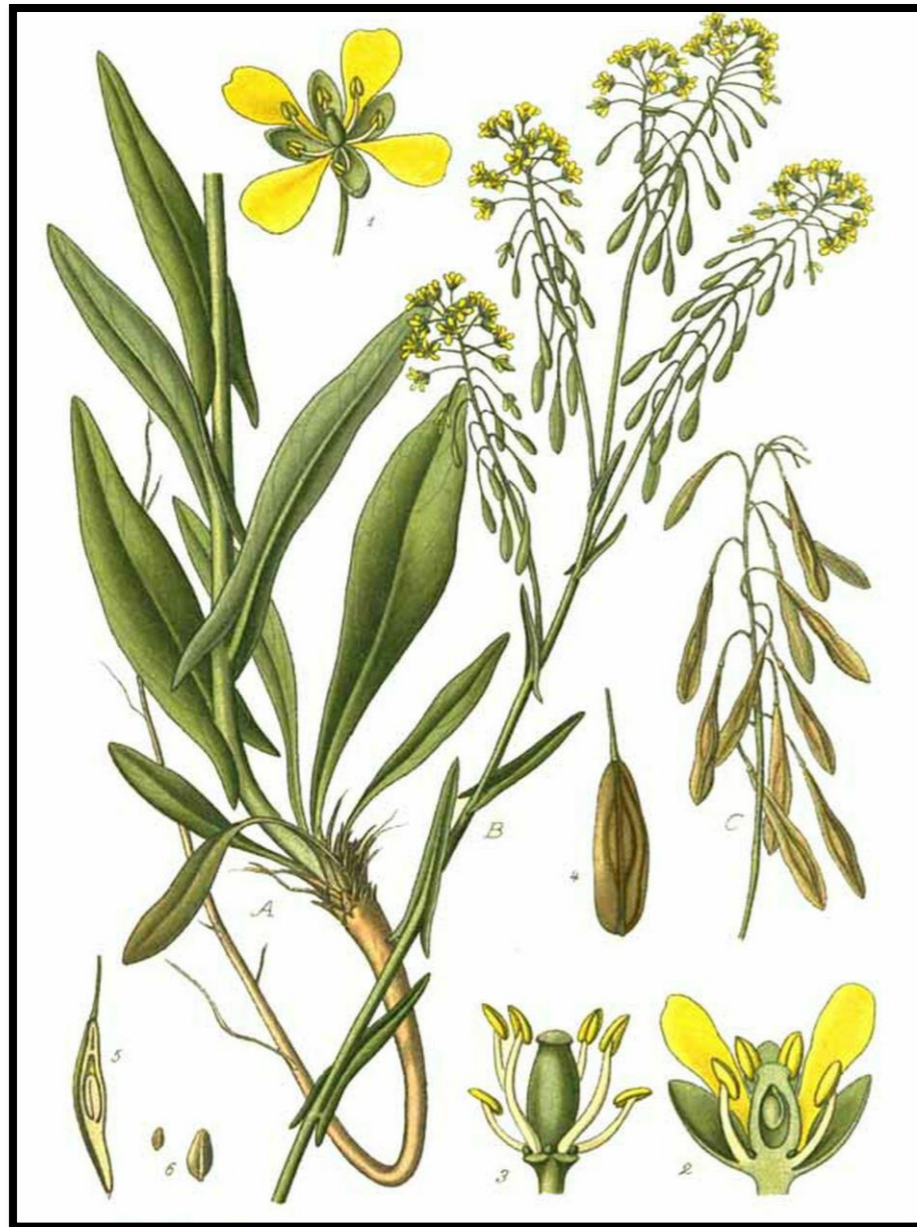
### Hairy-pod Pepperwort (*Lepidium lasiocarpum*) [A|EN]

With your hand lens, you can see the *hairy flattened pedicels and seed stalks* that distinguish this annual native from other mustards. The species name, *lasiocarpum* means woolly seeds or fruits. In fact, some botanists call the plant Shaggyfruit Pepperweed (Fig. 9.6.18). You might form your own preferred name by combining parts of these. According to Gledhill (1985), *lasio* is the Latin prefix meaning woolly or shaggy, so I guess you could substitute woolly without creating too much confusion. *Carpum* of course means fruit.



**Fig. 9.6.18** Hairy-Pod Pepperwort, subsp. *lasiocarpum*. (photo © Stan Shebs)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



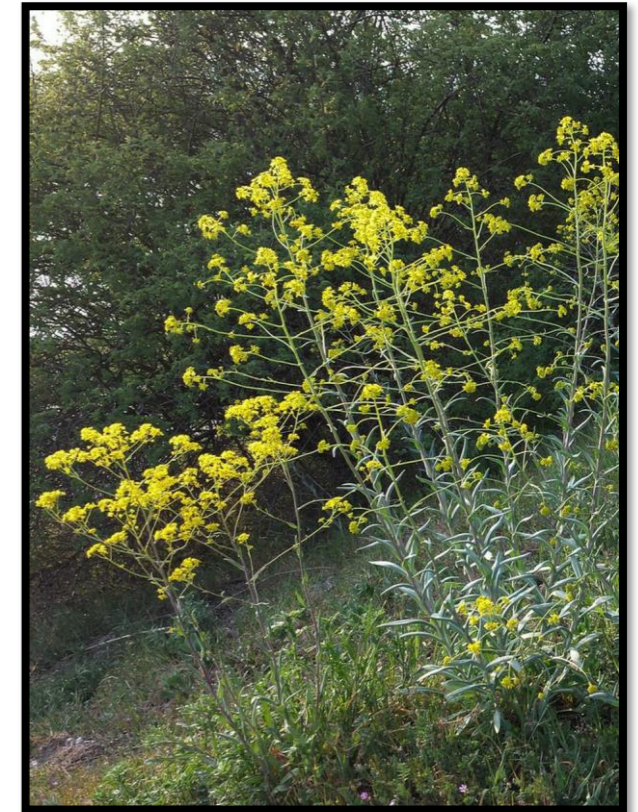
**Fig. 9.6.19** Dyer's Woad (*Isatis tinctoria*)—BRASSICACEAE. Biennial to 14-36in high. **Leaves:** Basal leaves hairy, 2-7in long, 1-4cm wide; stem leaves 1-4in long. **Flowers:** Yellow, 6mm wide with 3mm long petals. Born in compound racemes in a large terminal panicle. **a.** Lower portion of plant. **b.** Upper portion with flowers. **c.** Seeds. **1.** Flower. **2.** Flower cross section. **3.** Six stamen surrounding stigma. **4.** Achene. **5.** Achene bisected. **6.** Seed (Fig. 9.6.19 Amédée Masclaf - Atlas des plantes de France. 1891)

Weeds of Dewey-Humboldt, Arizona

### Dyer's Woad (*Isatis tinctoria*) [B|FI]

Not yet seen in D-H, Dyer's Woad (Fig. 9.6.20) is spreading across the region and could reach the farm soon. People cultivated the weed for thousands of years for indigo dye. In the early 1900's, synthetic dyes replaced Woad. It's an attractive plant, but there are reports it is spreading into grazed rangelands and might become a major problem.

**Fig. 9.6.20** Dyer's Woad (photo © Stefan Lefnaer)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]

## 9.7 HACKBERRY FAMILY—CANNABACEAE



**Fig. 9.7.1** Netleaf Hackberry (*Celtis reticulata*)—CANNABACEAE. Tree with round crown 1-16m tall, trunk less than 1m thick. **Leaves:** Smooth margins, pointed 1-4cm wide, 2-5cm long with prominent veins. Cystoliths (bumps on leaves formed of cells with calcium carbonate accumulations and surrounded by epidermal cells) are common. **Flowers:** Appear with leaves in early spring, 1-4 in leaf axils. **Fruit:** Drupes red, blackening as they ripen, oblate spheroidal, 5-10mm in diameter (Fig. 9.7.1 photo © Max Licher)

## Netleaf Hackberry (*Celtis reticulata*) [P|DEN]

This native tree of the North American deserts and arid western Great Plains has remained at home. Deer and several insect and moth species eat Hackberry leaves, and birds eat the fruit. Mature trees are usually less than 30ft tall. They are drought tolerant and can suppress sub canopy weeds. They make fine additions to D-H flora (Fig. 9.7.2).



**Fig. 9.7.2** Netleaf Hackberry with ripening berries (photo © GR)



## 9.8 HONEYSUCKLE FAMILY—CAPRIFOLIACEAE



**Fig. 9.8.1** Common Teasel (*Dipsacus fullonum*)—CAPRIFOLIACEAE. Three to eight feet tall, prickly all over. **Leaves:** Lanceolate, 8-16in long and 3-6cm wide with a row of small spines on the underside of the midrib. **Flowers:** Inflorescence: ovoid to cylindrical, 1-4in long. Involucral bracts are unequal, curving upwards, often surpassing the heads. Calyx silky, 1mm long, corolla 8-19mm, white with purple lobes 1mm long. **Seeds:** 5mm long mature in autumn retaining the calyx (Fig. 9.8.1 painting Jacob Sturm, Deutschlands Flora in Abbildungen, 1796)

Weeds of Dewey-Humboldt, Arizona

## Common Teasel (*Dipsacus fullonum*) [B|FI]

Teasel is a European biennial. It is not common in our area, but its distinctive inflorescence will catch your attention. At higher elevations, this plant can invade native vegetation and crowd out all native plant species.

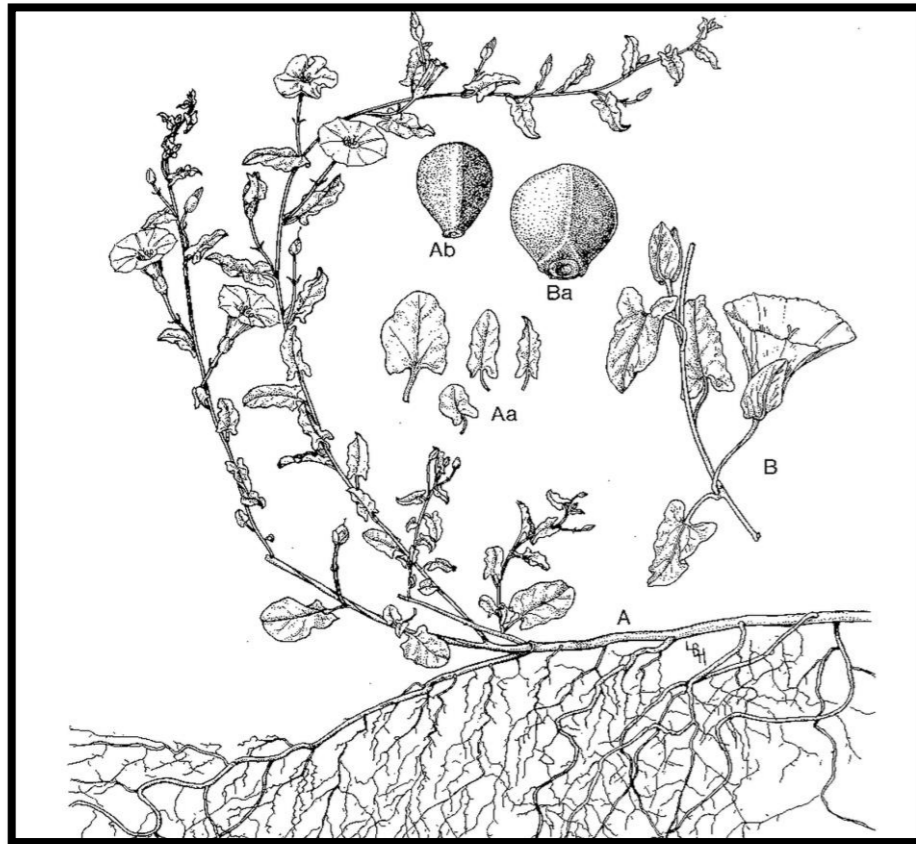
Navajos use the dry inflorescence to card wool, and people often add it to dried flower bouquets. Teasel is weakly carnivorous. The leaf axels form cups that hold water. When scientists added insects to the cups, the plants produced more seed (Fig. 9.8.2).

**Fig. 9.8.2** Flower (photo © AnemoneProjectors)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]

## 9.9 MORNING GLORY FAMILY—CONVOLVULACEAE



**Fig. 9.9.1** Bindweed (*Convolvulus* spp.)—CONVOLVULACEAE. Field Bindweed's (*Convolvulus arvensis*) slender stems spread 1-10ft from a deep taproot. They climb fences and other plants. **Leaves:** Eggshaped, lobed at base, 2-5cm long alternate on 6-20mm long stalks. **Flowers:** Funnelshaped, white or pink, 2-3cm long and 2-3cm wide arising from leaf axils. A pair of narrow pointed bracts, 3-5mm long occur on the stalks. There are five sepals, *five fused petals*, and *five stamens that fuse with the petals*. **Seeds:** Seedpods are 4-6mm long and contain 1-4 dark brown or black eggshaped seeds 3-5mm long. **a.** Field Bindweed. **Aa.** Various shapes of leaves. **Ab.** Seed.

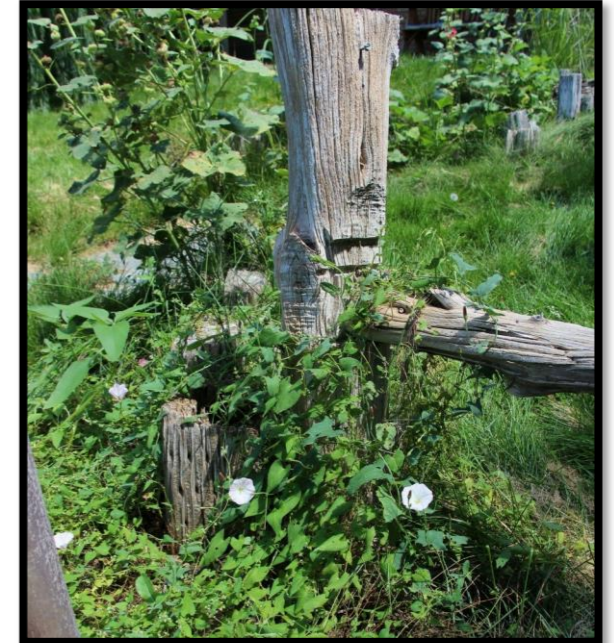
Hedge Bindweed (*Convolvulus sepium*) resembles Field Bindweed, but **leaves** are longer, 6-9cm, and *the two leaf stalk bracts are much larger*, 13-25mm long and just below the flower. The **flowers** are larger, 4-6cm long. **b** Hedge Bindweed branch with flower. **Ba.** Seed.

Black Bindweed (*Polygonum convolvulus*) leaves resemble Field Bindweed but the flowers are tiny and green or tinged purple (Fig. 9.9.1 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

## Bindweed (*Convolvulus* spp.) [P|TZ-1]

One Master Gardener I know says Bindweed is her greatest problem. Wherever and whenever disturbances expose soil on roadsides and in cultivated fields, yards, gardens, and even native woodlands, Bindweed will be there. The plant does best where there is something to climb including fences, stakes, and other plants. On other plants, it can get so dense it hinders growth. The plant is difficult to eradicate; it forms deep root systems from which it sprouts anew every spring (Fig. 9.9.2).

**Fig. 9.9.2** Bindweed climbing over itself struggling to reach the glorious heights of the 2ft post beside my front walk (photo © GR)





**Fig. 9.9.3** Scarlet Morningglory (*Ipomoea coccinea*)—CONVOLVULACEAE. Hairless annual with ridged, often reddish stems climbing nearby plants or structures or trailing on the ground; reproduces only by seed. **Leaves:** Alternate 4-7cm long on 1-4in long stalks, may be unlobed on some plants and heartshaped with a long pointed tip on others. On some varieties (e.g. var. *hederifolia*), some or all leaves have 3-5 fingerlike lobes. **Flowers:** Bright red, trumpetshaped 2-3cm long and 1-2cm wide. Stalks 3-5in long arise in leaf axils and support two or more flowers. **Seeds:** Globular seedpods have 4-6 black seeds about 3-4mm in diameter. **a.** Seedpod. **b.** Seed (Fig. 9.9.3 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

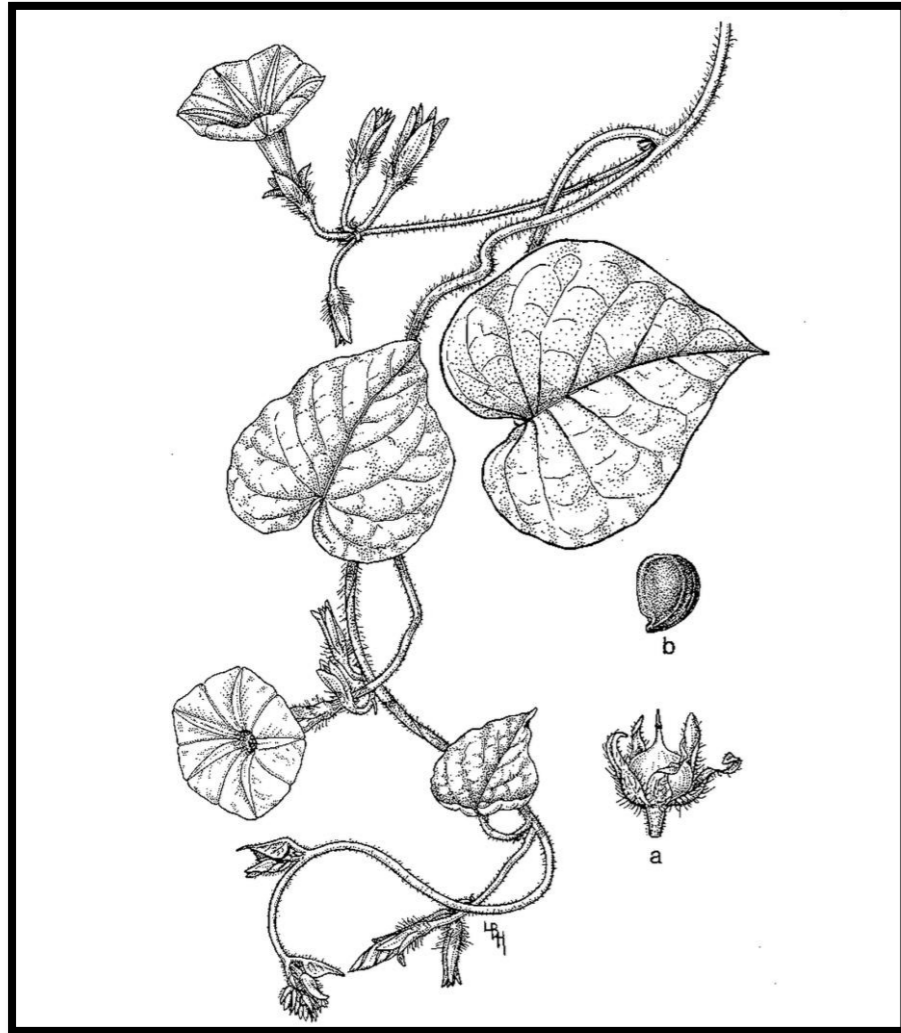
### Scarlet Morningglory (*Ipomoea coccinea*) [A|DN]

This beautiful morningglory is native to the southeastern U. S. People introduced it to the Southwest where it is now present beside roads, along waterways, and in any disturbed place where there is supplemental water. It climbs the volunteer sunflowers on the edge of my back lawn, and it is present down near the river. Around D-H, you will see it in rocky depressions and beside streets. In your yard, you may find it climbing on other plants and fences (Fig. 9.9.4).



**Fig. 9.9.4** Scarlet Morningglory (photo © GR)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.9.5** Tall Morningglory (*Ipomoea purpurea*)—CONVOLVULACEAE. Annual reproduces by seed. Climbing or trailing stems are hairy, 5-13ft long. **Leaves:** Heartshaped, unlobed, hairy, pointed, 2-4in long on stalks 2-4in long. **Flowers:** White to blue, purple, or bright pink with variable markings (those I've seen are pale purple); 4-8cm long, 4-5cm wide with a hairy five-lobed calyx 1-2cm long. **Seeds:** Globeshaped seedpods resemble those of Scarlet Morningglory and contain 4-6 flat seeds about 5mm long. **a.** Seedpod enclosed in calyx. **b.** Seed (Fig. 9.9.5 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### Tall Morningglory (*Ipomoea purpurea*) [A|D]

Occupies the same habitats as Scarlet Morningglory. Climbs sunflowers and other weeds to add twinkles of color amidst the green leaves. Introduced as an ornamental from Central and South America, Tall Morningglory has many cultivars. My favorite is Heavenly Blue, but like most of the others, the cultivar is not as persistent as the wild original. This weed can be a problem in some crops, but not so much in yards and gardens (Fig. 9.9.6).



**Fig. 9.9.6** Tall Morningglory (photo © GR)

## 9.10 GOURD FAMILY—CUCURBITACEAE



**Fig. 9.10.1** Buffalo Gourd (*Cucurbita foetidissima*)—CUCURBITACEAE. Large vines with deep tuberous roots and coarse stems that grow 30-40cm high and spread 10m or more. The bulging central taproot weighs up to 150 pounds. **Leaves:** Alternate, triangular, 10-20cm long, rough, hairy, progressively smaller toward stem tips. Each leaf paired with a thick, coiled tendril emerging from the stem just below the leaf petiole. The leaves are not lobed. **Flowers:** Large, yellow, solitary, separate male and female flowers on each plant (monoecious). Five pointed sepals much shorter than the five petals. **Fruit:** Spherical 6-8cm gourds green with white stripes drying yellow. **Seeds:** Flat ovate and numerous in each gourd. Similar gourds have lobed leaves

Buffalo Gourd montage. Top left: Three colors of maturing fruit. Top right: Staminate flower. Middle: Whole plant. Bottom left: Fruit broken open to expose seeds and pulp. Bottom right: Leaves, new fruits, and whitish fruit from the previous season. (Fig. 9.10.1 photographs: Up, from left to right: © Paigeblue08, © Paul Asman, © Jill Lenoble, and © Clark. Middle: © Paigeblue08. Bottom left: © Charle Bernardo. Bottom right: © Paigeblue08 (montage © RoRo)

### Buffalo Gourd (Coyote Melon) (*Cucurbita foetidissima*) [P|MN]

You will often see Buffalo Gourds from your car window while speeding along one of the Southwest's highways. In winter, the ripened yellow fruit resembles spilled oranges or lemons. Closer to home, you might spot the pointed pale leaves like the ears of an underground pixy elephant reaching through surrounding plants.

An elephant indeed, Buffalo Gourd stores moisture and carbohydrates in a tuber weighing up to 150 pounds. This reserve gives plants the ability to survive drought and aboveground assaults by browsing wildlife and lawn mowers. On overgrazed cattle ranges, you will find land where nothing remains but patches of Buffalo Gourd scattered across land devoid of other plants.

The plants grow throughout Arizona and scattered about in D-H. It died back in the dryer upper pasture at Coldwater Farm after I stopped irrigating. As human-exacerbated drought continues, the plant might survive in ditches beside roads and in lower flood plains where the tuberous roots can find moisture.

Controlling Buffalo Gourd isn't difficult if that's something you have to do. When the first leaves appear, stop their spread by applying a sharp shovel to the rooted stem. Feeling industrious, you could excavate the tuber and permanently eliminate the plant. Or you can keep cutting the rooted stem every month through the growing season. After a few years, the plant will die.

If you are interested in wildlife gardening, train a plant along your fence or in a waste place beside your garden. Wear gloves if you pick the flowers or your fingers will stink for days.

### 9.11 SEDGE FAMILY—CYPERACEAE



**Fig. 9.11.1** Yellow Nutsedge (*Cyperus esculentus*)--CYPERACEAE. Perennial 1-3ft tall, triangular stem, reproducing from seed, rhizomes running above ground and small dark underground tubers or nutlets 1-2cm long. **Leaves:** From near base, often longer than the stem, 3-8mm wide. **Flowers:** Umbrellalike tops have thin stems radiating from tip with yellow or golden brown spikelets 6-25mm long and 1-2mm wide. **Seeds:** Brown 3-angled achenes about 2mm long. **a** Flowering spikelet. **b**. Achene (Fig. 9.11.1 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

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### Yellow Nutsedge (*Cyperus esculentus*) [P|EN]

Yellow Nutsedge is a persistent opportunist on the margins of lawns and gardens. A North American native, the plant is now present in Australia, the Mediterranean region, South Africa, Yemen, Zambia, and probably elsewhere. Mowing or hoeing can control it (Fig. 9.11.2).



**Fig. 9.11.2** Yellow Nutsedge (photo © Blahedo)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]

## 9.12 OLEASTER FAMILY—ELAEAGNACEAE



**Fig. 9.12.1** Russian Olive (*Elaeagnus angustifolia*)—ELAEAGNACEAE. Shrub or small tree to 10m. Young twigs covered by silver scales become shiny brown with age. **Leaves:** Alternate, dark green with silvery scales, 4-10cm long, 12-24mm wide, smooth edges and pointed tips. **Flowers:** Fragrant, yellow, single or in clusters of 2-3 near leaf axils; silver to white outside, yellow inside a tubular four-lobed calyx. **Fruit:** Short stalked with soft pulp surrounding a yellow 10-15mm long achene covered with silvery white scales (Fig. 9.12.1 painting, P.J. Redouté in Duhamel, 1804)

### Russian Olive (*Elaeagnus angustifolia*) [P|DI]

With the Cold War at full intensity, Robert Austin, my student and friend in the Geography Department at the University of Utah became curious about Russian Olive. To see if the plant might have changed since its introduction from Asia to the U. S., he requested information from herbaria throughout Russia, the plant's homeland and America's sworn enemy. He didn't expect a response considering the strained relations between our countries. However, botanists at every herbaria he contacted sent photographs or negatives of their collections. Some even sent pressed plants. Espionage concerns had blocked nothing. The tree appeared unchanged.

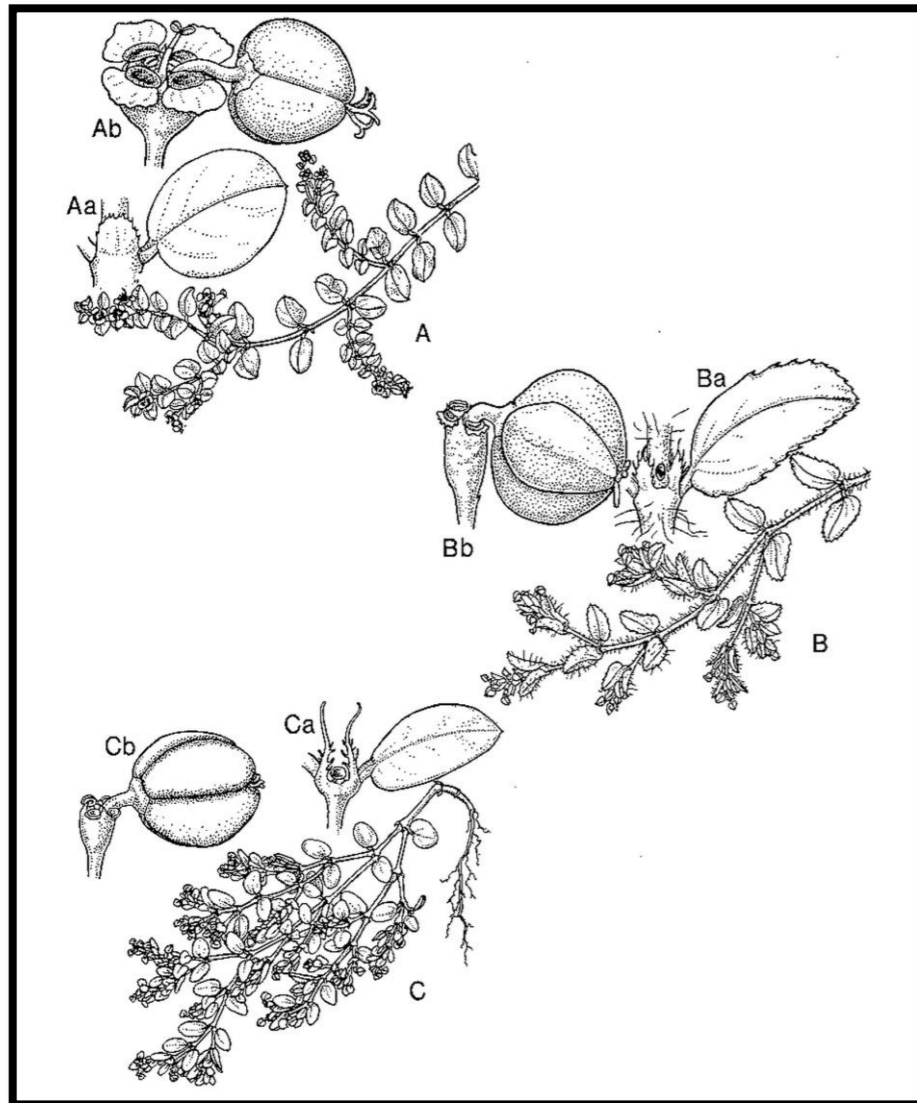
Russian Olive grows well in cold dry regions. The USDA introduced it during the Dust Bowl of the 1930's for windbreaks, snowbreaks, soil stabilization, wildlife habitat, and pollen for honeybees. People also planted the tree for the beauty of its silver-green leaves and its bright yellow sweet-scented flowers. Later the species' invasive tendencies became obvious as it spread through the Great Plains and along waterways in the West.

The one tree on the Agua Fria Floodplain bears heavy loads of sweet-scented flowers and fruit, but I've found no seedlings. Over the years, the tree has drooped, and it is shorter now than when we met 20 years ago (Fig. 9.12.2).



**Fig. 9.12.2** Russian Olive near the Agua Fria River (photo © GR)

## 9.13 SPURGE FAMILY—EUPHORBIACEAE



**Fig. 9.13.1** Whitemargin Spurge (*Euphorbia albomarginata*) [P|N]. **A** in the drawing. Prostrate hairless perennial reproduces from seed and roots forming mats to 40in across. **Leaves:** Opposite, smooth edged often with a red spot and trimmed in white. Two stipules unite to form a white sail at leaf-stalk base. **Flowers:** Cyathia (Involucre cup containing reduced stamens and single stigma) solitary in leaf axils. Involucres bell-shaped, hairless, 1mm high ringed by four green yellow to red oblong glands with a white to pink petaloid appendage often with a toothed edge; 15-30 staminate flowers. **Seeds:** Three-lobed hairless seedpods contain three whitish seeds 1-2mm long. **Aa.** Leaf with white membranous scale at stalk base. **Ab.** Seedpod with four petaloid appendages

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and four involucre glands (Fig. 9.13.1 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Sawtooth Spurge (*Euphorbia serrula*) [A|N]. **B** in the drawing. Prostrate to upright annual with *hairy stems*. **Leaves:** Opposite, *serrulate (saw toothed) edges* and uneven bases. Sometimes red along midvein. **Flowers:** Cyathia solitary or clustered in the nodes near branch tips. Involucres are cone-shaped to bell-shaped, 1 mm high, and almost hairless, with 4 greenish-yellow glands around the edge, each with a white to pink petaloid appendages wider than the gland; 7-15 staminate flowers. **Seeds:** Smooth capsules 2mm long contain a smooth seed. **Ba.** Sawtoothed leaf with two tiny stipules at base. **Bb.** Seedpod with small glands and petaloid appendages

Littleleaf Spurge (*Euphorbia micromera*) [A|N]. **C** in the drawing. Prostrate annual. **Leaves:** Opposite, short stalked with even bases, less than 5mm long with smooth edges. **Flowers:** Less than 1mm, petaloid appendages absent, red to pink with 2-5 staminate flowers in five clusters around one pistillate flower with 3 styles and 3 ovary chambers. **Seeds:** Capsules 1-2mm long with 1-2mm long white to brown seeds. **Ca.** Leaf with two triangular stipules. **Cb.** Seedpod showing lack of Involucral petaloid appendages (Fig. 9.13.1)

### Spurges (*Euphorbia* spp.)

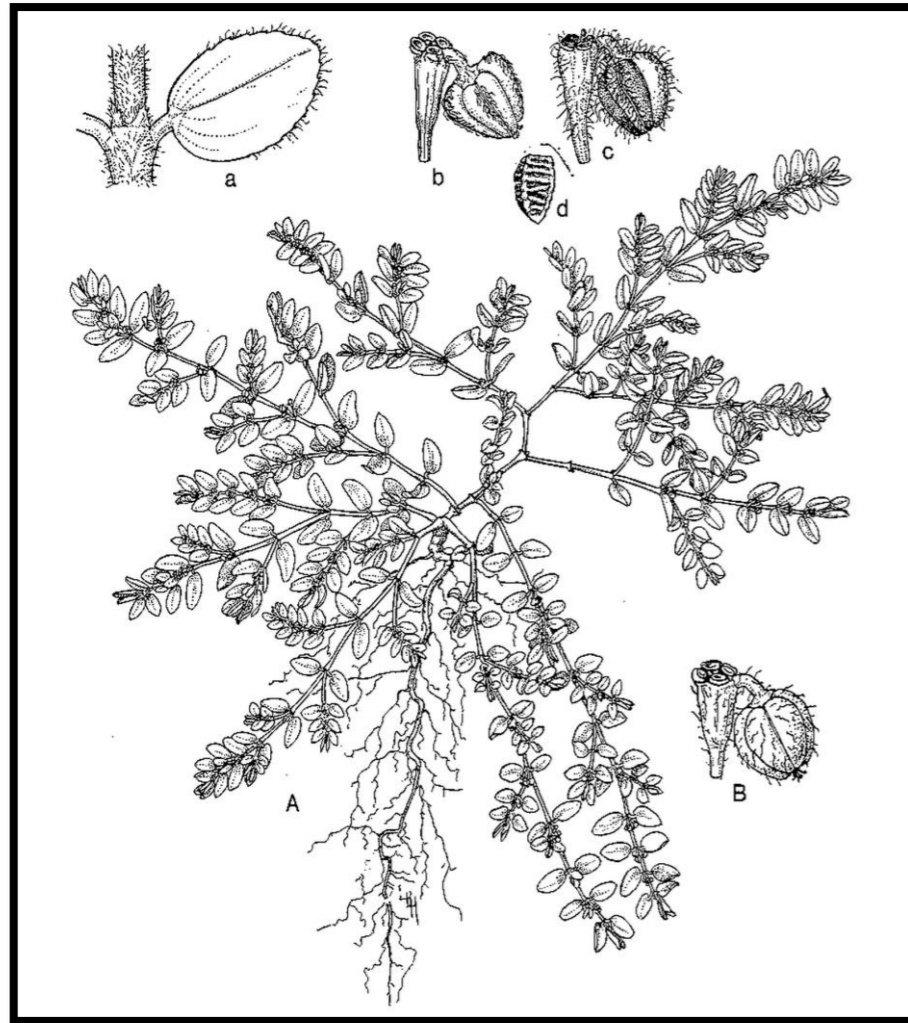
These three Spurge species along with Groundfig Spurge (next) grow in many places in D-H. Littleleaf was and is the most abundant around my home and was thick in the front lawn. We pulled it and now it grows in the gravel we spread over the driveway. The spurges produce no thorns or annoying seeds, deer browse them, so we leave them alone (Fig. 9.13.2).

**Fig. 9.13.2** Littleleaf Spurge with mature seeds (photo © Stan Shebs)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]





**Fig. 9.13.3** Groundfig Spurge (*Euphorbia prostrata*)--EUPHORBIACEAE. Mat forming annual partially erect where competing for light. Pink to red stems have short spreading or curved hairs. **Leaves:** Opposite green or purplish leaves hairless above, sparsely hairy below, 3-8mm long. Two tiny scalelike stipules may be present above the base of the leaf stalks. **Flowers:** Tiny pinkish flowers composed of stamens and pistils in small clusters. Three-lobed seedpods are less than 2mm long, hairy on the three ribs. **Seeds:** Oblong, 1mm long with four angles and 6-8 sharp wrinkles on each face. **A.** Prostrate plant. **a.** Leaf with tiny stipules near stalk base (not always present). **b.** Seedpod with ridge hairs lying on surface. **c.** Seedpod with erect ridge hairs. **d.** Groovy little seed. **B.** *Euphorbia supina* seedpod (Fig. 9.13.3 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### Groundfig Spurge (*Euphorbia prostrata*) [P|T]

Though a tropical family, the spurges occur in many temperate subtropical locations like D-H. A Caribbean native, Groundfig Spurge is one of those few New World species that has established in the Old. In fact, the plant has such a long Old World history indigenous people have had time to learn several medicinal applications of the plant. In D-H, the plant competes with grasses, invading lawns and pastures where it grows below the reach of mower blades and is difficult to eradicate. Spend a few pleasant hours sitting in the grass pulling spurge and soon it will be gone.

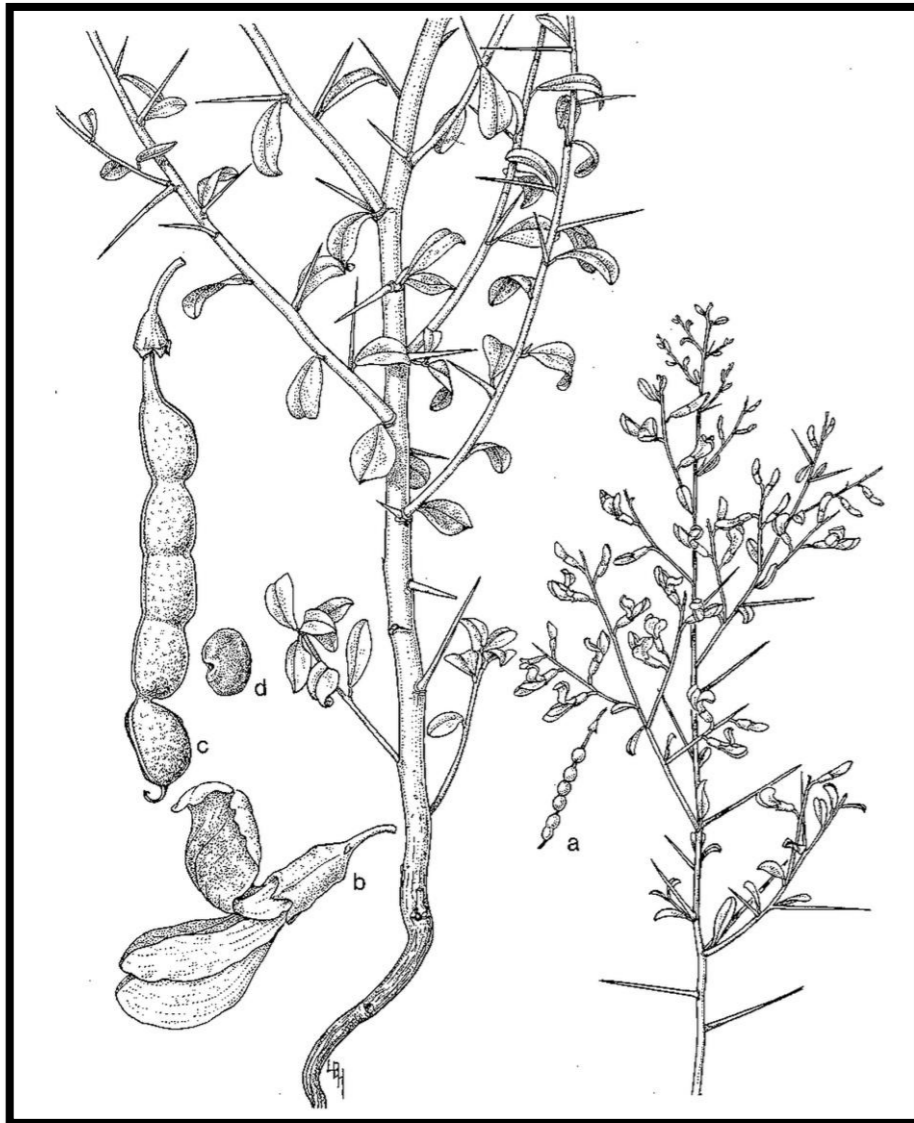
The local Rock Squirrels often eat the spurges.

An unusual characteristic of the D-H spurges (Groundfig and the previous three) is their opposite leaf pattern. Most members of the spurge family have alternate leaves (Fig. 9.13.4).



**Fig. 9.13.4** Groundfig Spurge (photo © Toony)

### 9.14 PEA (LEGUME) FAMILY—FABACEAE



**Fig. 9.14.1** Camelthorn (*Alhagi maurorum*)—FABACEAE. Matures at 18-48in tall. Reproduces from seed and from its roots and extensive rhizomes. Green stems bear green, yellow tipped spines 6-44mm long. **Leaves:** Alternate 3-13mm wide and 6-32mm long. **Flowers:** Small 10mm pea flowers are pink purple to maroon along spine-tipped branches. **Seeds:** Like other peas, the seedpod indents to show each of its 1-9 seeds. **a.** Pod normal size. **b.** Enlarged flower. **c.** Enlarged pod. **d.** Enlarged seed (Fig. 9.14.1 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)  
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### Camelthorn (*Alhagi maurorum*) [P|FIPTZ2]

Camelthorn reminds me of childhood on another desert river, the Little Colorado in Northeastern Arizona. Across the street from my “country” home was a field of Rubber Rabbitbrush (*Chrysothamnus*), Fourwing Saltbush (*Atriplex*), and other shrubs and forbs. Beyond that, a broad Saltcedar (*Tamarix*) grove bordered the River. Camelthorn grew all along the roads and irrigation ditches, in our yard, and in patches almost everywhere else. Sharp thorns piercing our denim pants taught us to avoid any territory the plant had claimed.

This Eurasian perennial develops root systems to six feet and can send up new shoots 20 feet from parent plants. The roots will keep spreading until they meet bedrock or water barriers.

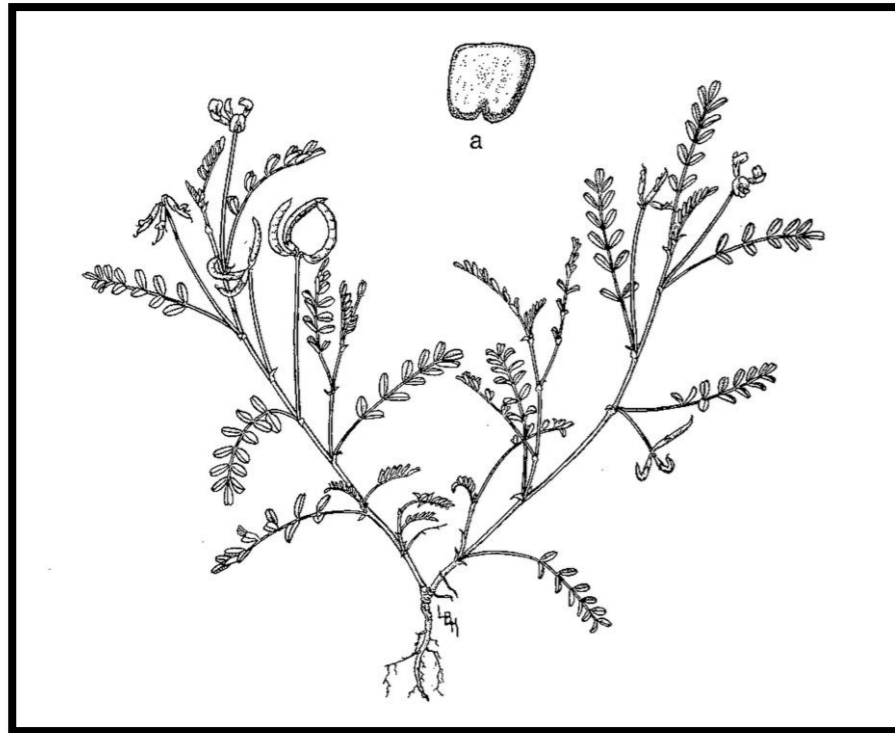
Though the thorny plant can be an impediment to travel on foot, it does enrich the sites it colonizes by accumulating nitrogen in root nodules and by moderating salinity as its roots decay.

Camelthorn has reached the area surrounding D-H. Once spotted here, I’ll go find a shovel (Fig. 9.14.2).

**Fig. 9.14.2** Camelthorn flower (photo © Eitan F)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



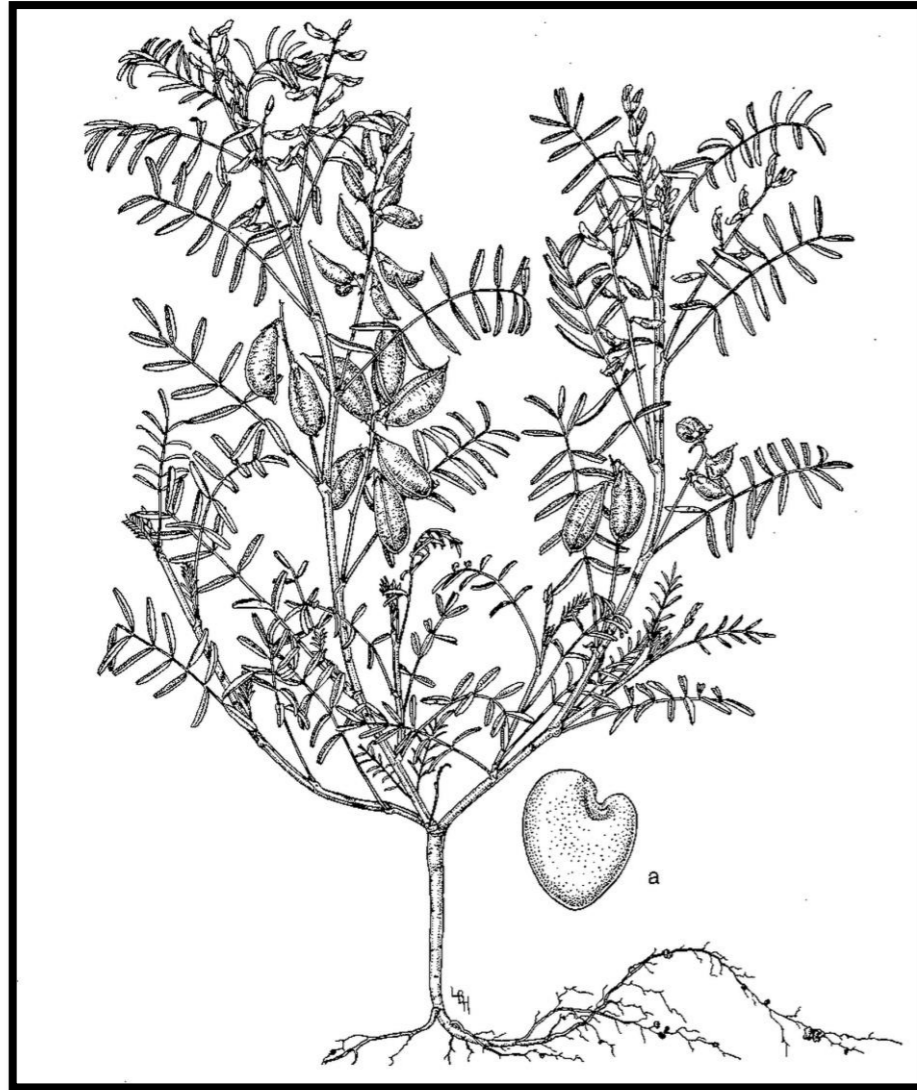
**Fig. 9.14.3** Nuttall Milkvetch (*Astragalus nuttallianus*)—FABACEAE. Gray, slender annual with gray hair flat on surfaces, reproduces only from seed. Less than 1ft high spreads 6-40in. **Leaves:** Three to six (sometimes eight) pairs of small leaflets with rounded, pointed, or notched tips. **Flowers:** Small, pale purple to almost white turn blue when dried. Two to six cluster at the ends of stiff stalks 1-3in long arising from leaf axils. **Fruit:** Flat pea pods 12-20mm long and 2-3mm wide curve upward. Pods remain on plants until they turn black. **a.** Seeds are 2mm long, flat with a deep notch on one side. **a.** Seed (Fig. 9.14.3 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### Nuttall Milkvetch (*Astragalus nuttallianus*) [A|N]

Common weed of disturbed sites in D-H and across the region. The plants will colonize lawns and gardens, but its small thin stems and leaves are no match for mower blades or springtime pulling. Like other legumes, Nuttall Milkvetch is toxic to livestock and its roots accumulate nitrogen. The nitrogen is a valuable nutrient used by other plants. Not a bad weed to have in some lawns; it is probably healthier than artificial fertilizers (Fig. 9.14.4).



**Fig. 9.14.4** Nuttall Milkvetch (photo © Kaldari)



**Fig. 9.14.5** Wooton Loco (*Astragalus allochorous* var. *playanusii*)—FABACEAE. Spreading annual reproducing from seed. Sprawling branches less than 12in long. **Leaves:** Pinnately compound, divided into 4-11 pairs of small gray leaflets 2-3mm long. **Flowers:** Purple, 5-10, 6-8mm long on stalks 2-7cm long arising in leaf axils. Fruit: Thin, papery pods 7-28mm long, straight on one edge. **Seeds:** Brown, flat, about 3mm long with a notched edge. **a.** Seed

Halfmoon Loco (*Astragalus allochorous*)—FABACEAE. Erect to partially erect perennial very similar to Wooton Loco, but with longer branches (1-2ft), more leaflets (11-19), and larger (>28mm) seedpods (Fig. 9.14.5 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### Wooton and Halfmoon Loco (*Astragalus allochorous*) [P|N]

*Astragalus* has more species and varieties worldwide than any other genus. There are over 200 in Arizona. Some are as weedy as Wooton and Halfmoon, but this pair will at least give you drawings and descriptions of two examples (Fig. 9.14.6).



**Fig. 9.14.6** Wooton Loco (Siberian Elm seedling in center) (photo © GR)



**Fig. 9.14.7** White Sweetclover (*Melilotus albus*)—FABACEAE. Annual or biennial reproduces by seed, 1-6ft tall. Apart from flower color (white), White Sweetclover is very similar to Yellow Sweetclover, but *Yellow's stems are not as erect*. **Leaves:** Three leaflets on long stalks, similar to Yellow Sweetclover. **Flowers:** White, about 5mm on spikelike stalks 2-8in long. **Seeds:** About 2mm long in pods 2-3mm long. **a.** Seed. **b.** Flower stalk with spikelike inflorescence (Fig. 9.14.7 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### White Sweetclover (*Melilotus albus*) [A-B|D]

I did not find the origin of this species. It is present at mid and low latitudes on every continent except Antarctica. Bees and butterflies love this weed. If you want more of them in your yard, let a patch of White Sweetclover grow. Supplemental water may be necessary (Fig. 9.14.8).



**Fig. 9.14.8** White Sweetclover (photo © Ivar Leidus)



**Fig. 9.14.9** Yellow Sweetclover (*Melilotus officinalis*)--LEGUMINOSAE. Annual or biennial reproduces by seed, 1-6ft tall. Similar to White Sweetclover, but White's stems are more erect. **Leaves:** Three leaflets on long stalks, similar to White Sweetclover. **Flowers:** Yellow, about 5mm on spikelike stalks 2-8in long. **Seeds:** About 2mm long in pods 2-3mm long. **a.** Seed. **b.** Flower stalk with spikelike inflorescence (Fig. 9.14.9 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### Yellow Sweetclover (*Melilotus officinalis*) [P|DI]

Bees, birds, and butterflies love Yellow Sweetclover. Like other legumes, the plant stores nitrogen, and though it is an alien introduced species, it tends to be restricted to moist habitats across the deserts (Fig. 9.14.10).



**Fig. 9.14.10** Yellow Sweetclover with Red-tailed Bumblebee (photo © Ivar Leidus)



**Fig. 9.14.11** Annual Yellow Sweetclover (*Melilotus indicus*)--LEGUMINOSAE. This erect annual has spikelike inflorescences and small drooping flowers. **Leaves:** The compound leaves are 1-3cm long and have three leaflets. They have small teeth above the middle and a dull red bar beside the midrib. *Their tips are indented or blunt.* **Seeds:** The round seedpod is about 2mm long and holds one or two seeds. Seeds are eggshaped, 1-2mm long, dark greenish brown, with rough surface. Flowers are 3-6mm long, droop as they age. **a.** Seedling. **b.** Pealike flower. **c.** Seed (Fig. 9.14.11 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

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### Annual Yellow Sweetclover (*Melilotus indicus*) [A|F]

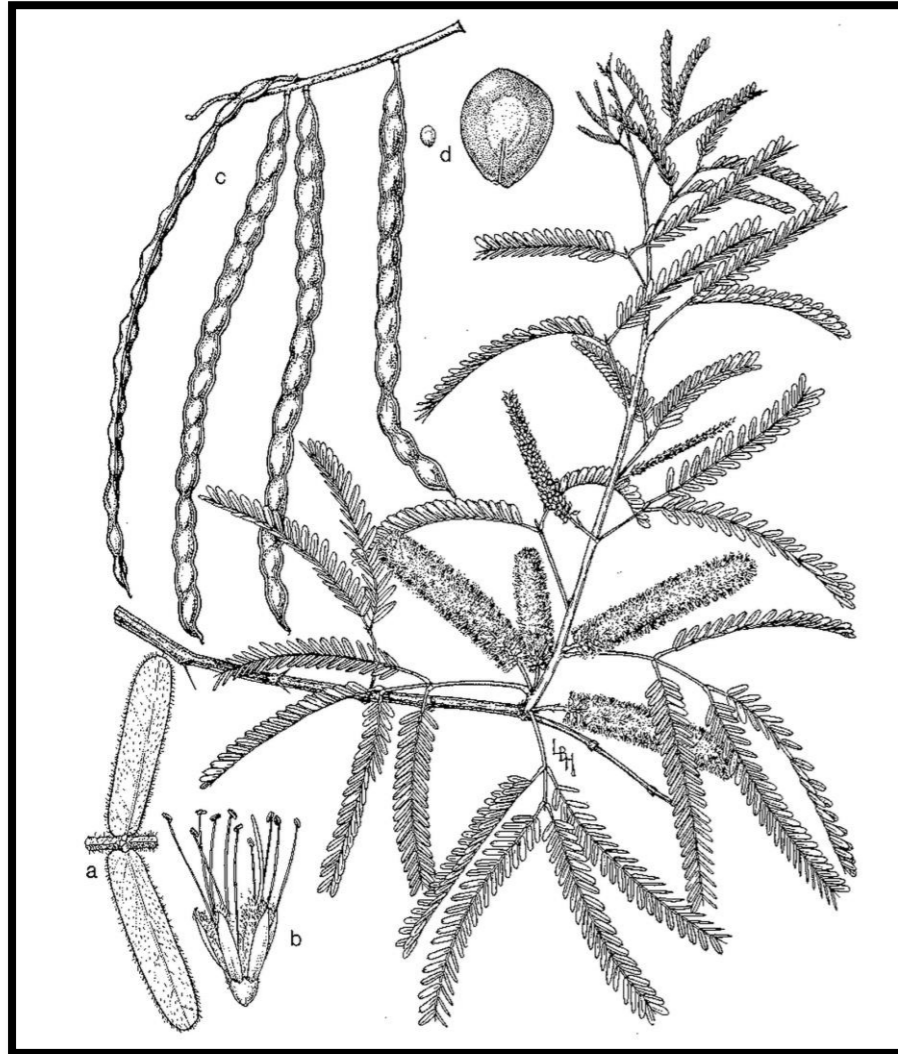
This Mediterranean and Middle Eastern clover is near D-H, but I haven't yet spotted it. Annual and sometimes biennial, the plant flowers from fall to spring in moist sites including lawns, gardens, streamsides, and farms.

Yellow Sweetclover feeds bees and other pollinators but is poisonous to some mammals. According to the Encyclopedia of Life, it can repel bed bugs and clear constipation. I haven't checked the sources for these uses, but as the climate warms and humidity increases, repelling bedbugs might become a serious concern (Fig. 9.14.12).



**Fig. 9.14.12** Annual Yellow Sweetclover. Tiny yellow flowers droop as they age (photo © Eigene Arbeit, selbst fotografiert)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



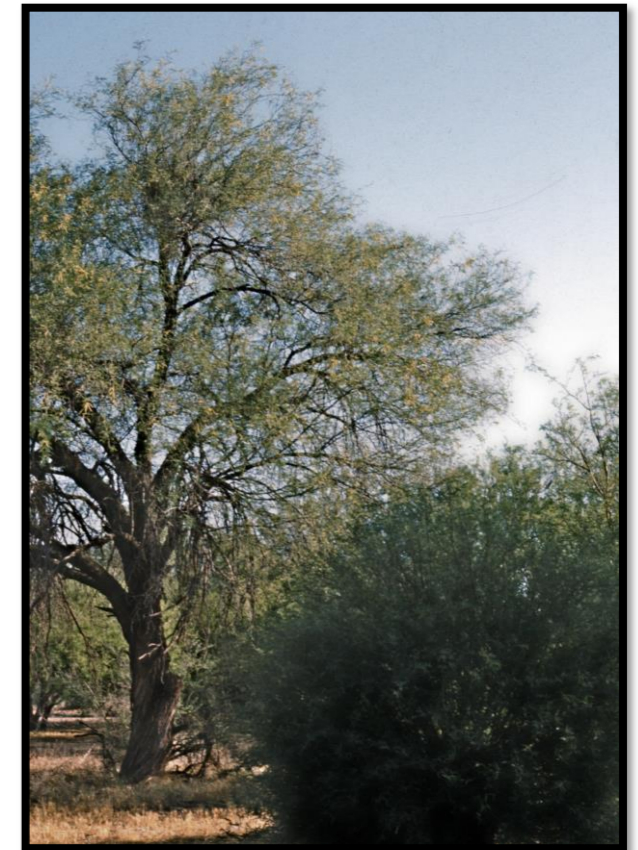
**Fig. 9.14.13** Western Honey Mesquite (*Prosopis juliflora*)--FABACEAE. Deciduous shrub or small tree to 50mm tall and trunk 1-4ft thick. Yellow spines in pairs 6-150mm long. **Leaves:** Double pinnate compound 3-8in long divided in to leaflets with 10-28 secondary leaflets 6-19mm long. **Flowers:** Fragrant, yellow, crowded on stalked spikes 2-5in long. **Seeds:** Tan pods 3-8in long with sweet pulp and brown seeds. **a.** Pair of secondary leaflets. **b.** Flower. **c.** Seed pods. **d.** Seeds, one enlarged (Fig. 9.14.13 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### Western Honey Mesquite (*Prosopis juliflora*) [P|DEIMN]

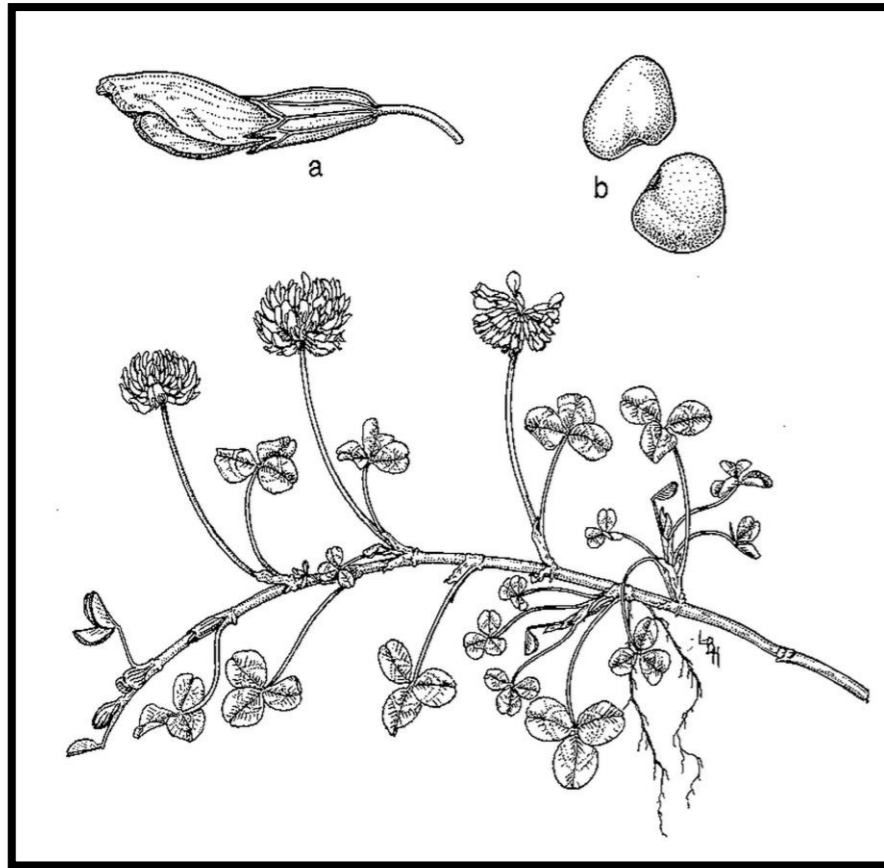
These small trees have slight presence in D-H and might have been abundant in the past. Cut for firewood and fence posts, mesquite numbers are probably much smaller than they were before Euro-American miners and farmers arrived. Mesquite is a weed of national significance in Australia and a serious problem in many other arid locations here.

Where Mesquite is a native, wildlife species use its flowers, beans, and seedpods. If you have a tree in a corner of the yard, your wildlife viewing will improve (Fig. 9.14.14).

**Fig. 9.14.14** Western Honey Mesquite tree optimum growth at site with high water table. Shrub at right is a clump of mesquite sprouts from the stump of a tree cut for posts or fuel (photo © GR)







**Fig. 9.14.15** White Clover (*Trifolium repens*)--LEGUMINOSAE. Hairless perennial with creeping stems rooting at joints. **Leaves:** Alternate, long erect stalks, three leaflets (or four every 10,000 leaves), notched at the apex. **Flowers:** Numerous tiny pink or white in globelike heads 1-3cm wide. **Seeds:** Rounded, 2mm long in pods. **a.** Flower. **b.** Seeds (Fig. 9.14.15 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### White Clover (*Trifolium repens*) [P|D]

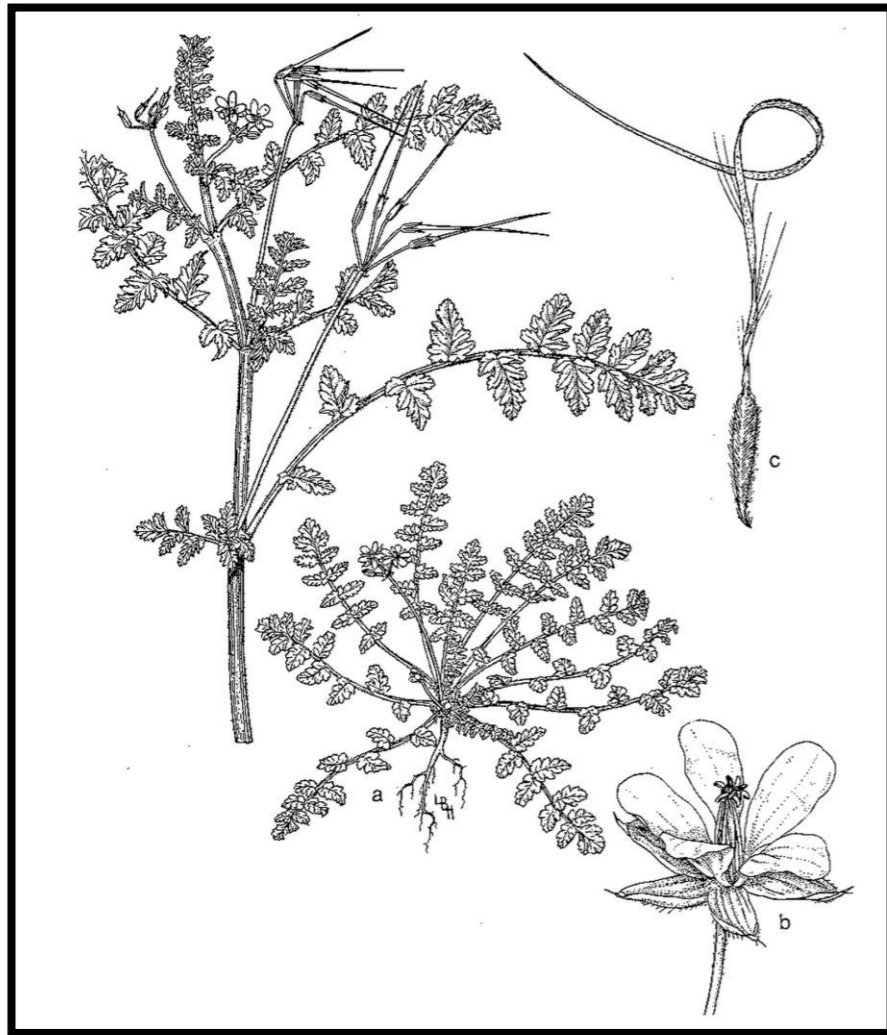
This interesting weed might confer good luck when it produces an extra leaflet, but more interesting is the plant's ability to flee its competitors. Only about one in ten thousand White Clover leaves will bear an extra leaflet, but all the plants you see are mobile across generations. White clover requires a moist site if it is to grow in D-H. You might find a small patch of clover shoots in your lawn. If you mark the boundary of the patch with small stakes, perhaps nails with a few inches of flagging, you can watch the patch roam about your lawn as it sends up leaves and flowers from one area of shoots and lets other areas die. Thus, the plant avoids competition by shifting its position like a guerilla army (Harper 1977).

White Clover attracts bees, butterflies, grasshoppers, moths, mice, javelina, and deer. I keep a patch in the yard for visitors and residents. Mowing the margins prevents spreading (Fig. 9.14.16).



**Fig. 9.14.16** White Clover with a Common Checkered Skipper (*Pyrgus communis*). This butterfly prefers mallow flowers, but clover is good too (photo © GR)

## 9.15 GERANIUM FAMILY—GERANIACEAE



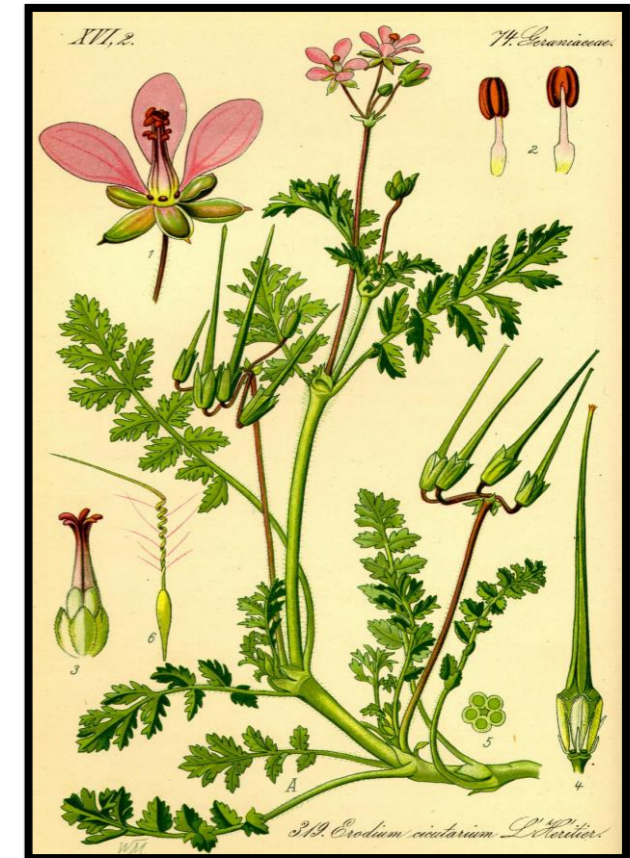
**Fig. 9.15.1** Redstem Filaree (*Erodium cicutarium*)—GERANIACEAE. Dark green winter annual or biennial reproducing from seed. Branching stems 3-24in long erect or prostrate with tips ascending. **Leaves:** Alternate, hairy, 1-10 cm long with 3-7 pairs of stalkless leaflets divided into fine segments; *first leaves form distinctive rosette*. **Flowers:** In umbrellalike clusters at ends of stalks arising from leaf axils. Five rose-purple petals are 6mm or less long. **Fruits:** Needlelike, split into five one-seeded very hard fruits each with a 1-2in long tail that forms a tight corkscrew when dry. Tails uncoil when wet and screw seeds into hardest soil. **a.** Basal rosette of young plant. **b.** Flower. **c.** Fruit with uncoiling tail (Fig. 9.15.1 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

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Redstem Filaree (*Erodium cicutarium*) [A|MI]

Also known as Heron's Bill and Stork's Bill, this is one of the most successful alien species in the western U. S. It grows in the warm Sonoran Desert south of D-H and the cold Great Basin to the north. Following wet winters, it produces seeds that burrow into the soil and germinate the next spring. The mature plants dry out by early summer, burn readily, and help create the weed vegetation replacing ecosystems worldwide (Fig. 9.15.2).

**Fig. 9.15.2** Redstem Filaree by Otto Wilhelm Thomé, *Flora von Deutschland*, 1885



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]

## 9.16 WATERMILFOIL FAMILY—HALORAGACEAE



**Fig. 9.16.1** Eurasian Watermilfoil (*Myriophyllum spicatum*)—HALORAGACEAE. Perennial aquatic herb 3-30ft long. Branches at water surface forming dense mat. **Leaves:** Whorls of four or five, pinnate with 12-20 segments per side. Uppermost leaves often squared at tip. **Flowers:** Green, born in terminal spike 5-10cm long above water surface. Male flowers, present near the tip, have eight stamens. **Fruit:** Lobed nut-like cluster 2-3mm long separate into four segments. **Winter buds:** Absent. **Insets:** a. Growth form. b. Whorl of leaves (x2). c. Flower spike with pistillate flowers below and staminate flowers above (x4). d. Immature fruit (x4). e. Mature fruit (x4) (Fig. 9.16.1 Drawing by Regina O. Hughes, U. S. Geological Survey, public domain)

Weeds of Dewey-Humboldt, Arizona

## Eurasian Watermilfoil (*Myriophyllum spicatum*) [P|FI]

This common fish-tank plant is present in local streams, lakes, and ponds worldwide. It is a problem when runoff from farms contains nitrogen and phosphorous fertilizers. The artificial enrichment permits the plant to expand in the spring. Together with floating algae, it can become so thick it blocks the light native plants need. This reduces native fish populations and forces waterfowl to move away to find more nutritious native plants. Eurasian Watermilfoil is spreading across North America. I haven't seen the plant in D-H, but I expect it will arrive (Fig. 19.6.2).



**Fig. 9.16.2** Watermilfoil (painting by Kurt Stüber - Pub Domain)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.16.3** Parrot's Feather (*Myriophyllum aquaticum*)—HALORAGACEAE. Aquatic, very leafy, stout stems can extend 1ft above water surface. **Leaves:** Whorled 2-5cm long with 10-18 segments on each side, stalks 5-7mm long. **Flowers:** In leaf axils and about 2mm long. Only pistillate white flowers present in N. America (Fig. 9.16.3 photo © André Karwath)

### Parrot's Feather (*Myriophyllum aquaticum*) [P|FI]

Parrot's Feather is native to the Amazon River in S. America, but today it has global distribution—cosmopolitan the botanists say. In N. America, the plants are all female, reproducing from fragments broken off rooted plants. The weed invades water with high nutrient content, a characteristic of modern farm-polluted streams and lakes. It can grow so thick it blocks sunlight from native species and when those die, the fish depending on them die.

I haven't seen the plant in the Agua Fria River or the River's floodplain ponds. However, pet shops often place Parrot's Feather in fish tanks. From there, a viable fragment will eventually make it into the river.

Neither physical nor chemical controls are effective with Parrot's Feather. Great Britain banned sale of the plant and other country bans will follow (Fig. 9.16.4).



**Fig. 9.16.4** Parrot's Feather (photo © Harry Rose)

## 9.17 IRIS FAMILY--IRIDACEAE



**Fig. 9.17.1** Yellow Flag (*Iris pseudacorus*)—IRIDACEAE. This Old World native forms clumps of stiff leaves 1.5m tall with scattered yellow flowers 7cm wide. Rhizomes are pink, branching, 2-3cm in diameter. Seeds are flat, D-shaped, 6-7mm wide, lustrous with shallow pits. Flowers appear April to June (Fig. 9.17.1 photo © GR)

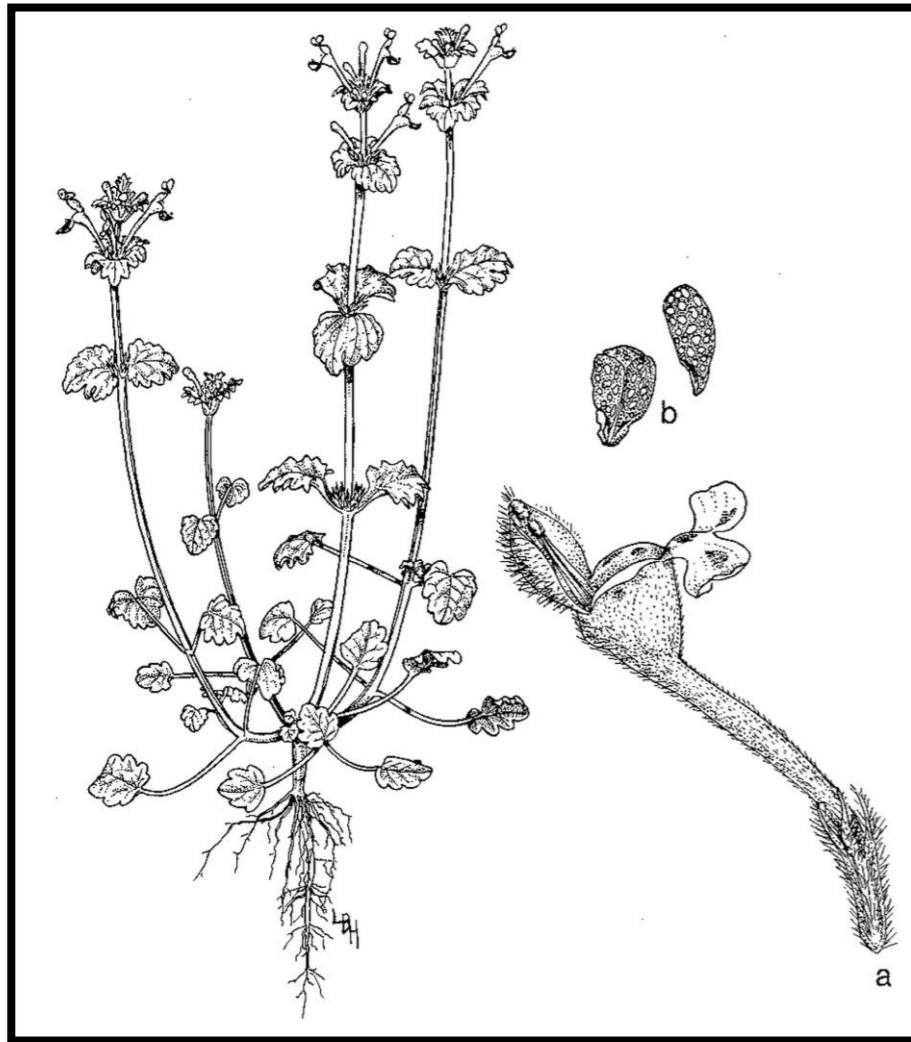
## Yellow Flag (*Iris pseudacorus*) [P|DIT]

Yellow Flag colonizes the borders of desert streams and ponds at middle latitudes. Nurseries distribute the plant despite its invasive tendencies. Once it establishes, Yellow Flag's robust roots and rhizomes make eradication of large stands difficult to impossible. Like many other weeds, it is important to remove this one when first noticed (Fig. 9.17.2).



**Fig. 9.17.2** Yellow Flag on a pond bank near the Agua Fria River (photo © GR)

## 9.18 MINT FAMILY—LAMIACEAE



**Fig. 9.18.1** Henbit (*Lamium amplexicaule*)—LAMIACEAE. Annual or biennial reproducing from seeds, stems rooting at lower joints, sometimes from rhizomes. *Square stems* 4-16in tall branch from the base. **Leaves:** Widely spaced, opposite, less than 1in long, hairy, with shallow lobes. Lower leaves on slender stalks, upper leaves broader, stalkless, and clasping. **Flowers:** Stalkless, born in upper leaf axils, pink or purple, tubular 8-17mm long with two lips. The upper lip has spots, the lower is hairy on its back. **Seeds:** The yellow hairy calyx has five sharp bristlelike teeth. It remains on the plant and encloses a four-lobed fruit. The calyx separates into four triangular nutlets about 2mm long. **a.** Flower. **b.** Seedlike nutlets (Fig. 9.18.1 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

**Henbit (*Lamium amplexicaule*) [A-B|E]**

This Eurasian annual is present throughout the New World and is doing well around my house where it is spreading in the dry gravel between the bird garden and tractor shed. Of all the weeds that pop up there, it is the least offensive. Others have painful seeds or grow into giants that obstruct movement. Henbit works away at covering the gravel without causing any pain.

Henbit blooms from late February through the summer. The early start lets it make seeds before the spurge and taller plants shade it later in the spring. The flowers are nice, but too small to merit a D (Fig. 9.18.2).

**Fig. 9.18.2** Henbit flowers  
(photo © Patrick Alexander)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.18.3** Horehound (*Marrubium vulgare*)—LAMIACEAE. Dense, woolly stems branching from the base grow 9-40in tall. Upper portions of stems are square. **Leaves:** Green above, white woolly underneath, opposite, corrugated, round with rounded teeth, 1-2in long including stalks. **Flowers:** Stalkless, white, tubular 6-8mm long in dense clusters around the stem. The clusters are at the ends of all branches and often extending over one foot down the stem. The persistent calyx has hooked spines. **Seeds:** The calyx contains four nutlets each holding one eggshapped dark brown seed 2mm long. **a.** Calyx with ten hooked spines. **b.** Views of the seedlike nutlet (Fig. 9.18.3 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

### Horehound (*Marrubium vulgare*) [P|EIP]

Horehound is a perennial alien abundant in D-H. It thrives in the warm arid climate of the western U. S. and in similar environments worldwide. It was used for flavoring for hard candy and cough drops. Though Horehound use continues, it is a good example of the many plants that become problems when they escape cultivation.

Unlike the incoming tide of new weeds, Horehound has been here long enough to reach all the suitable sites in the region. When we moved to Coldwater Farm in 1997, the plant had taken over the pastures and pond banks. I tried eradicating it by mowing it and spraying it with herbicides. Nothing worked, so I hired local kids to help me pull the plants. We pulled and disposed of mountains of Horehound. After that, mowing and occasional pulling along the pond banks was effective. After the 2021 fire here at the Farm, Horehound made an amazing comeback. The next owner will have a big job removing it.

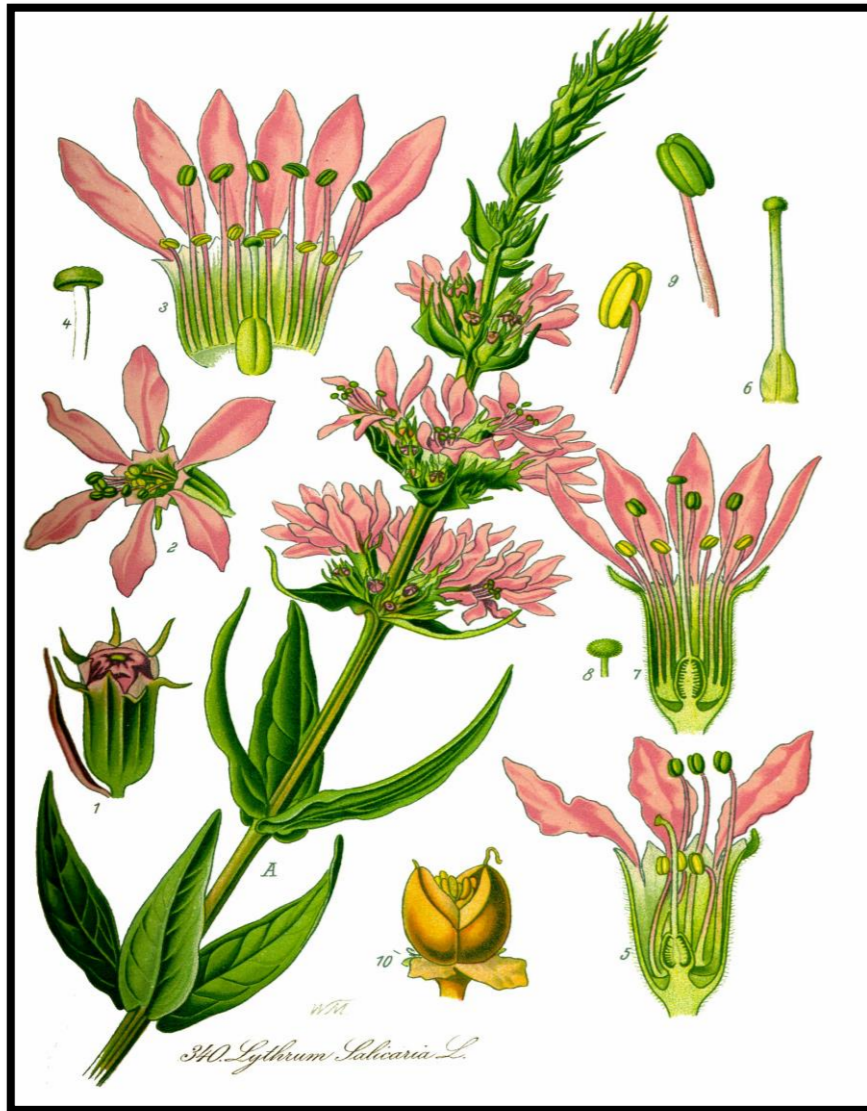
Horehound disperses in animal fur. It has hooked seeds that bind fur into dense mats. To relieve your pets of their matted fur-pads, get out the scissors (Fig. 9.18.4).

**Fig. 9.18.4** Horehound flowers (photo © GR)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]

## 9.19 LOOSESTRIFE FAMILY—LYTHRACEAE



**Fig. 9.19.1** Purple Loosestrife (*Lythrum salicaria*)—LYTHRACEAE. Perennial 50-150cm tall. Forms many stemmed clones from a single woody root mass. **Leaves:** Opposite or whorls of three, stalkless, pointed, more than 5cm long (on basal stem at lower left of drawing). **Flower:** Purple, crowded on spike 10-40cm long, sepals and petals fused into slender tube. Petals wrinkled and separated for half their length of about 1cm. **Fruit:** Many seeded two-chambered capsule enclosed by the sepal-petal tube (lower center of drawing) (Fig. 9.19.1 Drawing: Otto Wilhelm Thomé, 1885)

Weeds of Dewey-Humboldt, Arizona

**Purple Loosestrife (*Lythrum salicaria*) [P|FM]**

According to contributors to the IUCN Global Invasive Species Database, this Eurasian weed is one of the 100 world's worst invasive species. It prefers moist sites in which it spreads by root and seed choking out native plants. Some roadside ditches in the region might give it access to D-H, but the most likely entrance is the Agua Fria River.

The plant supplies nectar and pollen to many insects. However, the threat it poses to native vegetation merits concentrated eradication efforts. Biological control using insects that feed on the plant has been successful. For instance, root feeding *Hylbius transversovittatus* and flower ovary feeding *Nanophyes marmoratus* weaken and restrain the weed's growth and spread (Fig. 9.19.2).

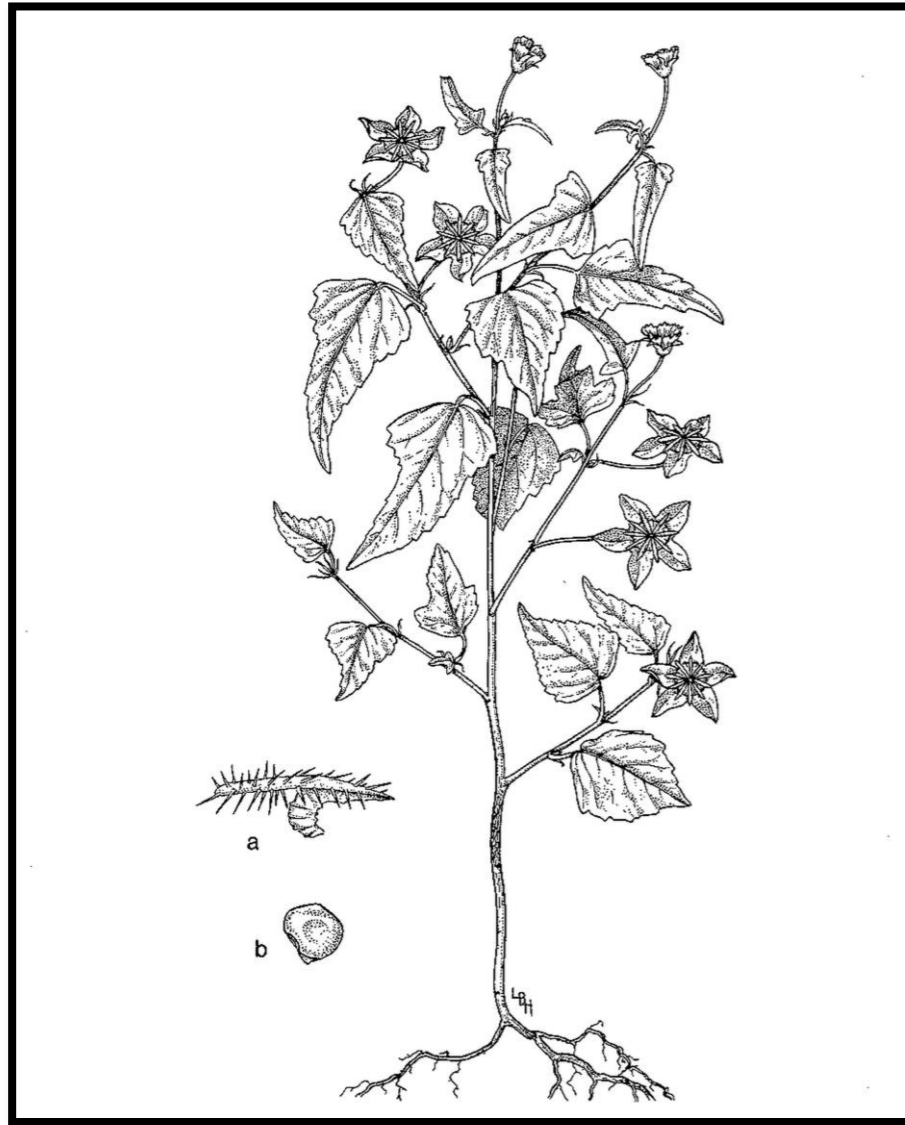
**Fig. 9.19.2** Purple Loosestrife on the edge of a pond (photo © H. Zell)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



## 9.20 HIBISCUS FAMILY—MALVACEAE



**Fig. 9.20.1** Spurred Anoda (*Anoda cristata*)—MALVACEAE. Annual reproducing by seed. **Leaves:** Alternate triangular, 4-8cm long with shallow lobes, toothed margins and often with a red stripe down the center. **Flowers:** Pale purple, 2-3cm long. **Fruit:** Flattened disk surrounded by five-lobed calyx. The disk has 9-20 sections that separate forming seed-like pods with dark hardened spur 2mm long and covered with yellow hairs. **Seeds:** dark gray, wedgeshaped about 3mm long. **a.** Spurred seedpod. **b.** Seed (Fig. 9.20.1 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

## Spurred Anoda (*Anoda cristata*) [A|IN]

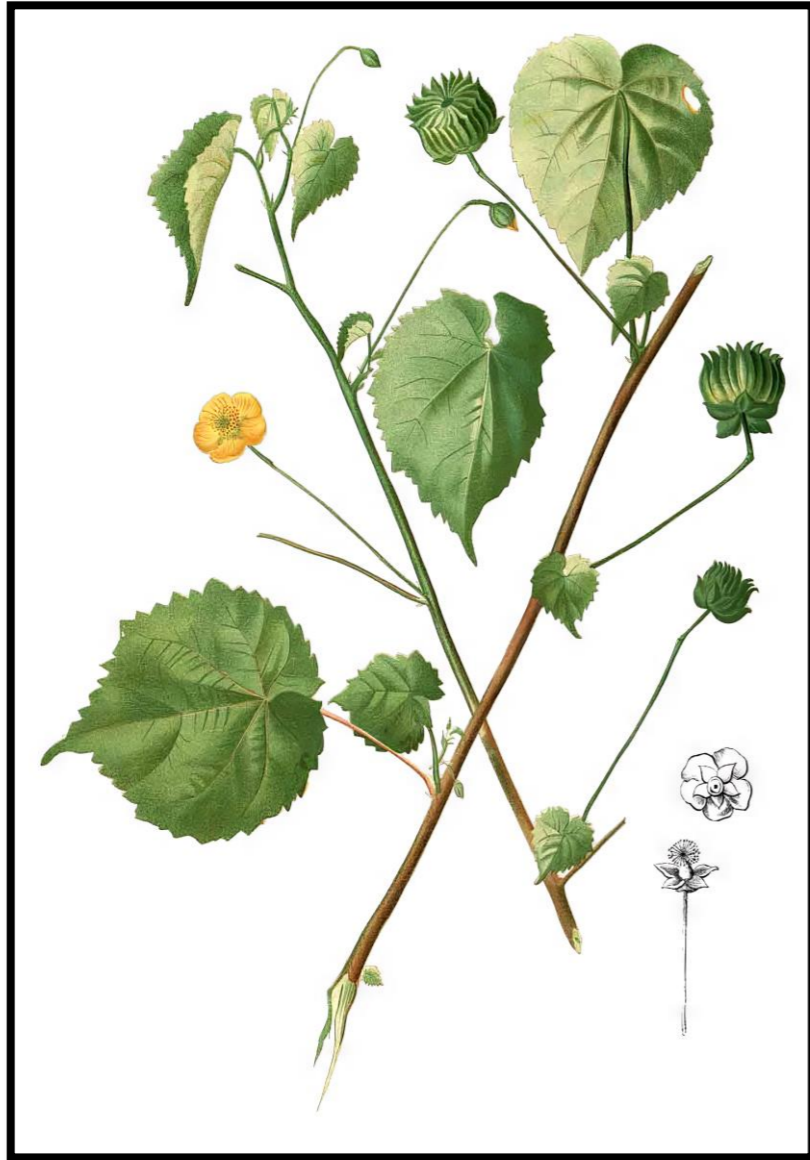
Common throughout D-H, this annual weed has distinctive seedpods and sharp triangular leaves often with a central red stripe. It is notable for being an American native succeeding in the Old World. It is now present in Europe, Africa, Japan, and Australia.

You can control small infestations of Spurred Anoda, but chemical-free safe control when plants have infested a crop requires hoeing, mulching, and crop rotation (Fig. 9.20.2).

**Fig. 9.20.2** Spurred Anoda fruit (photo © GR)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



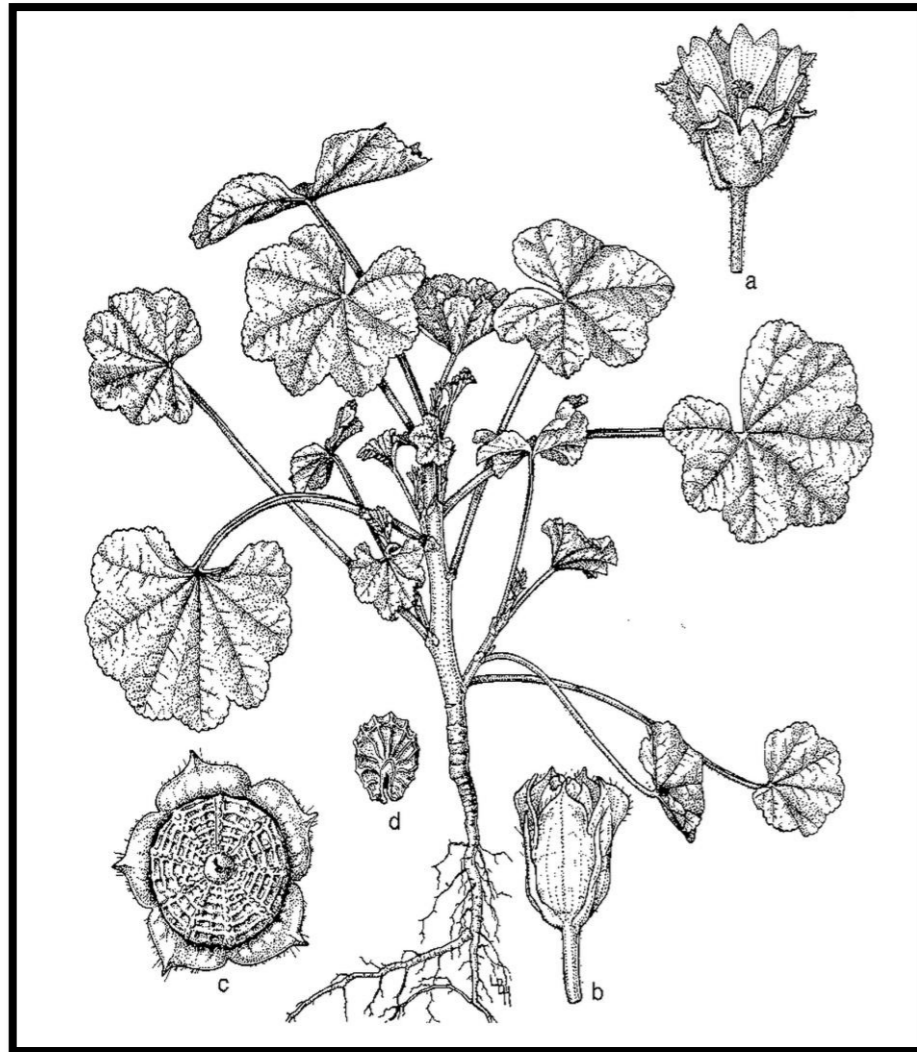
**Fig. 9.20.3** Sweet Mallow (Monkeyflower) (*Abutilon indicum*)--MALVACEAE. Annual velvety-pubescent shrub 2-6 feet tall. **Leaves:** Alternate, heart-shaped, 2-8in wide and long, toothed, on 1-5in long petioles. Stipules subulate, 1-2mm, curved outward. **Flowers:** Solitary, yellow, five petaled, 1-1.5in wide on pedicels 4-7cm long. **Fruit:** Circular, flat topped, 1.5cm diameter, with 11-20 radiating carpel. **Seeds:** Dark brown, reniform, 2mm in diameter (Illustration by Francisco Manuel Blanc (1778-1845). *Flora de Filipinas. Gran edicion Atlas II. Plate 557. Public Domain.*

### Sweet Mallow (Monkeyflower) (*Abutilon indicum*) [ ]

I first noticed this tropical immigrant in 2021. A solitary plant the first year became a ten-plant patch the second year. The plants are in a marginal area that gets supplemental water. The species' origin is uncertain, but initial reports were from tropical islands and the Pacific Basin, especially southern Asian lands. The plant's drought tolerance, beautiful leaves, and bright yellow flowers make it a common nursery flower, and its small seeds interest migratory birds. Like other Mallows, Monkeyflower has many medicinal qualities (Kane 2017, Rajeshwari 2018).



Fig. 9.20.4 Sweet Mallow flower (Public Domain photo by Harshjeet Singh Bal)



**Fig. 9.20.5** Little Mallow (*Malva parviflora*)--MALVACEAE. Spreading annual 1-3 feet tall. **Leaves:** Alternate, circular, 2-5in wide, on stalks 4-10in long, with 5-7 shallow lobes, toothed edges, and a red spot near the base. **Flowers:** Pale blue or pink, 6mm long, in clusters at base of leaf stalks. **Seeds:** Outer green sepals spread under the flower forming a round disk of 11-12 carpels. Each carpel contains one 2mm long brown seed. **a.** Flower. **b.** Closed flower in cooler temperatures. **c.** Fruit surrounded by five sepals. **d.** Carpel containing one seed (Fig. 9.20.3 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

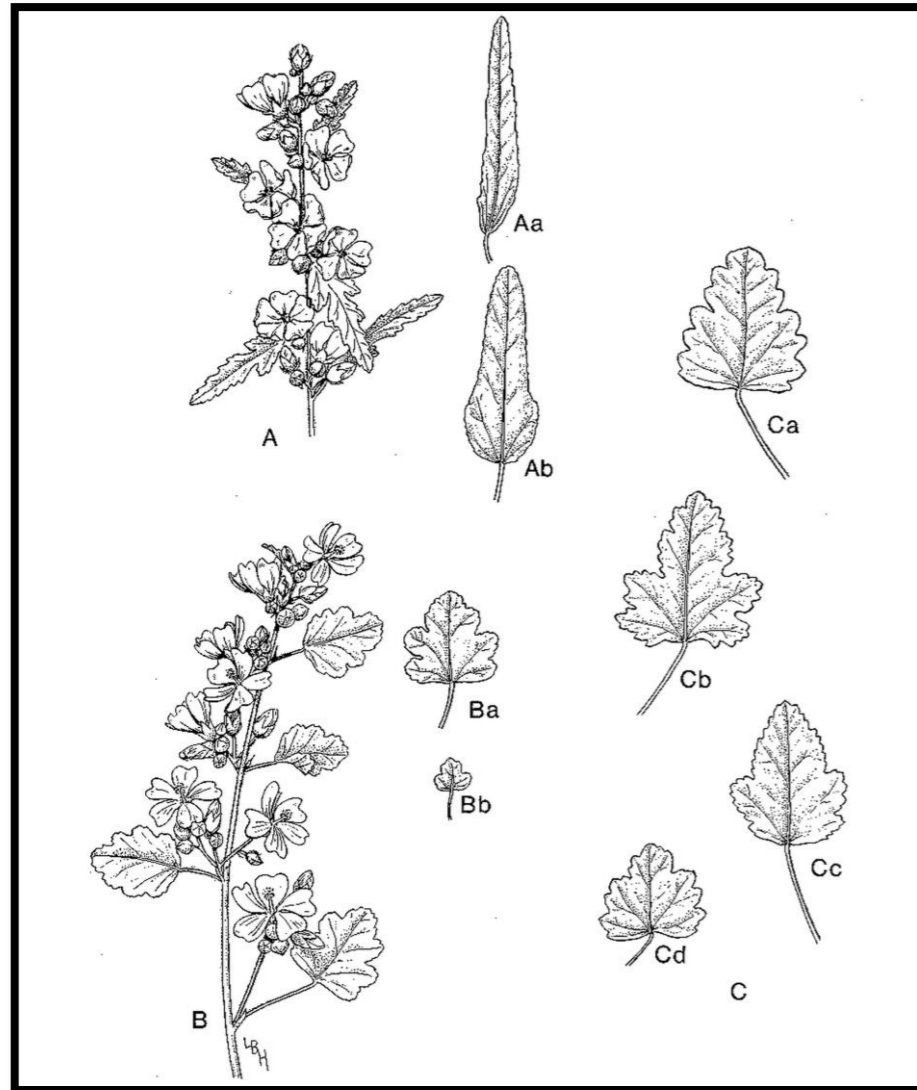
### Little Mallow (*Malva parviflora*) [A-B-P|M]

This weed is short-lived but it has strong roots that resist pulling. Mowing will keep the plants from spreading, but you have to pull them for complete eradication. Little Mallow has a long flowering season, and seeds mature quickly. So, if you are shooting for eradication, pull plants no later than the first flowers in spring (Fig. 9.20.4).

Keep a few plants around for their medicinal value. Dried plants have the most applications, but Moore says crushed fresh plants make great poultices for stings, inflammations, and pustular infections (Moore 2003: 155-156).



**Fig. 9.20.6** Little Mallow flowers (photo ©GR)



**Fig. 9.20.7** Narrowleaf Globemallow (*Sphaeralcea angustifolia*) A, Littleleaf Globemallow (*Sphaeralcea parvifolia*) B, and Caliche Mallow (*Sphaeralcea laxa*) C—MALVACEAE. These native perennial shrubs are 20-100cm tall with gray or white hair covering leaves and stems. New stems grow from thick woody root crown. **Leaves:** Alternate, 2-5m long with shallow lobes and toothed margins. **Flowers:** Deep orange with five petals 8-18mm long, born in short racemes or panicles. **Fruit:** Hemispherical with 9-12, 2-5mm long carpels with two seeds. The old volcanic soils of the hill southwest of town are the best habitat for Caliche Mallow (Fig. 9.20.7 is from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

### Globemallow (*Sphaeralcea* spp.) [P|MN]

The Globemallows are taller and have larger flowers than Little Mallow (*Malva parviflora*). The plants are perennial, but mowing will control their spread. However, you might want to keep the plants because they attract bees and butterflies (Fig. 9.20.6).

Another reason to keep a few plants around the house is their medicinal value. Moore says crushed fresh leaves make superb poultices for stings, inflammations, and pustular infections (Moore 2003: 155-156).



**Fig. 9.20.8** Narrowleaf Globemallow (photo © GR)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]

## 9.21 UNICORN-PLANT FAMILY—MARTYNIACEAE



**Fig. 9.21.1** Devil's Claw (*Proboscidea parviflora*)—MARTYNIACEAE. To 2.5m wide and 1m tall. **Leaves** broad triangles to 25cm long and 22cm wide, margins entire or 3 to 7 shallow lobes. **Flowers** hidden among leaves, tubular corolla pink, purple, or white, 5-15 on racemes to 25cm, pedicels 1-3cm long fruit developing to 45mm. **Fruit** green succulent capsule 5-7cm long and 2cm wide, glandular-pubescent when young, becoming woody when dry. Spectacular tough springy hooks 10-15cm long. Hooks clasp paws, hooves, and shoes (Fig. 9.21.1 photo © GR)

Weeds of Dewey-Humboldt, Arizona

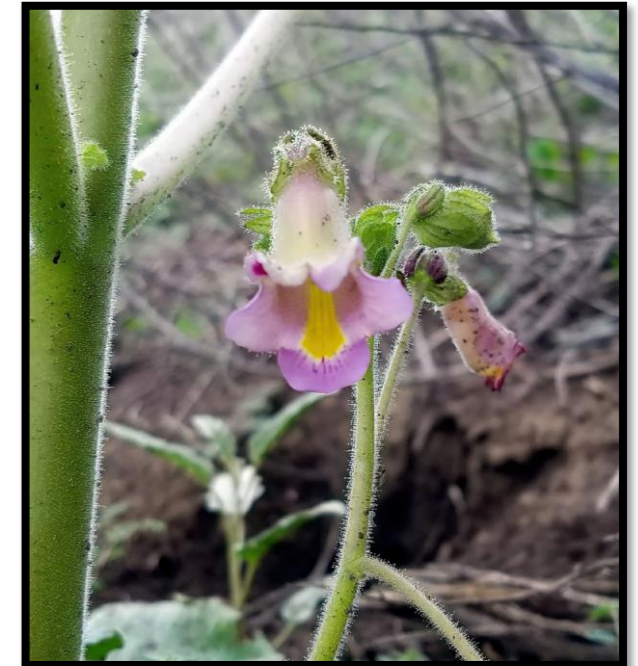
## Devil's Claw (*Proboscidea parviflora*) [A|DEN]

Devil's Claw seed capsules are said to be edible when immature, but I haven't tried them (Figs. 9.21.2-3).

**Fig. 9.21.2** Devil's Claw fruit. Though sharp tipped, the horns achieve dispersal mainly by claspng the feet of passing animals including great granddaughters (photo © GR)

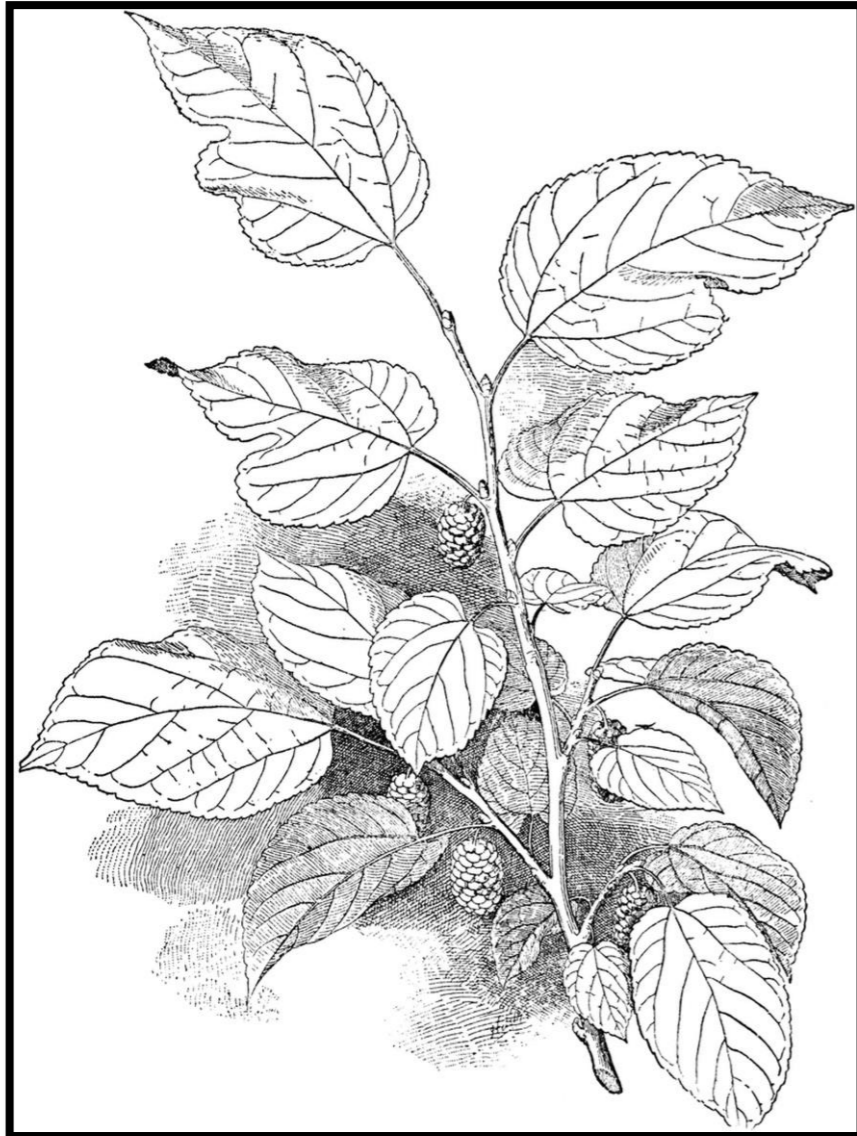


**Fig. 9.21.3** Devil's Claw flowers are attractive, but hide below the leaves (photo © GR)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]

## 9.22 MULBERRY FAMILY—MORACEAE



**Fig. 9.22.1** White Mulberry (*Morus alba*)--MORACEAE. Shrubs or trees to 15m. Red or brown bark with thin red or yellow furrows and long narrow ridges. **Leaves:** Pointed, toothed, 6-10cm long and 3-6cm wide, often with deep lobes. **Flowers:** Male (white or yellow green) and female (green) in drooping catkins on same or different plants. Sepals green with red tips. **Fruit:** Female transform into compound fruits. **Seeds** in light brown achenes 2-3mm in diameter (Fig. 9.22.1 drawing, Bailey, 1917)

### White Mulberry (*Morus alba*) [P|DE]

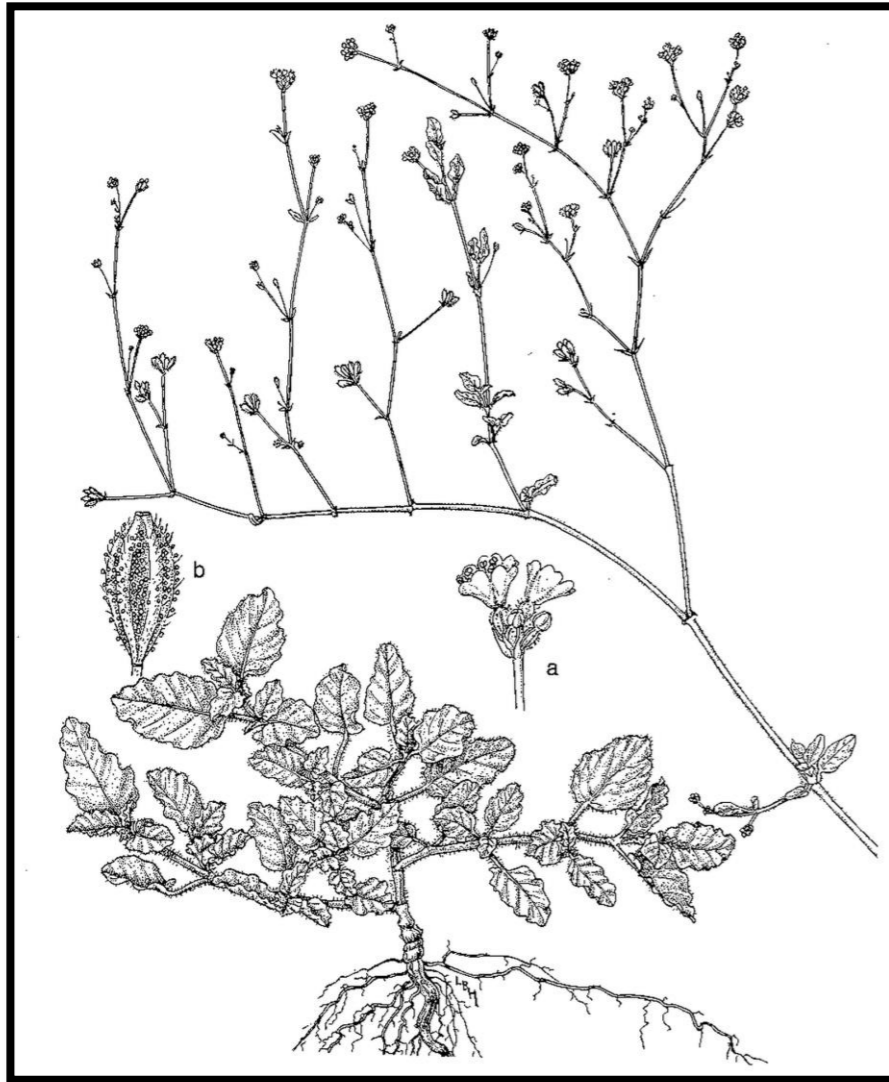
Birds drop mulberry seeds everywhere in D-H. Trees grow on lawn and garden margins and other places where there is extra moisture. If you want to keep the tree, trim all but one central shoot and within a few years, you will have a fine shade tree with fruit that attracts birds (and rock squirrels). If a seedling appears where you do not want a tree, don't wait too long to remove it. The longer you wait the more the roots develop and the more likely they will produce new shoots to replace any you cut (Fig. 9.22.2).

The trees produce all black or all white fruit. I can't taste the difference, but one visitor said she thought black was best.

**Fig. 9.22.2** White Mulberry. Young tree with a plethora of basal sprouts (photos © GR)



### 9.23 FOUR O'CLOCK FAMILY—NYCTAGINACEAE



**Fig. 9.23.1** Red Spiderling (*Boerhavia coccinea*)—NYCTAGINACEAE. Perennial with stout base and leaves but with fine stems radiating outward up to 6ft from the thick woody root. Stems often have sticky yellow bands above and are hairy near the base. **Leaves:** Opposite, eggshaped, 1-4in long, tomentose to hairless. Similar to Coulter Spiderling (next). **Flowers:** Small, brilliant magenta, umbrellalike clusters of 3-25 at tips of the many threadlike stems forming at maturity. **Fruit:** Five ribs, about 3mm long, hairy, sticky. **a.** Umbrellalike flower cluster. **b.** Fruit covered by glands emitting a sticky substance (Fig. 9.23.1 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

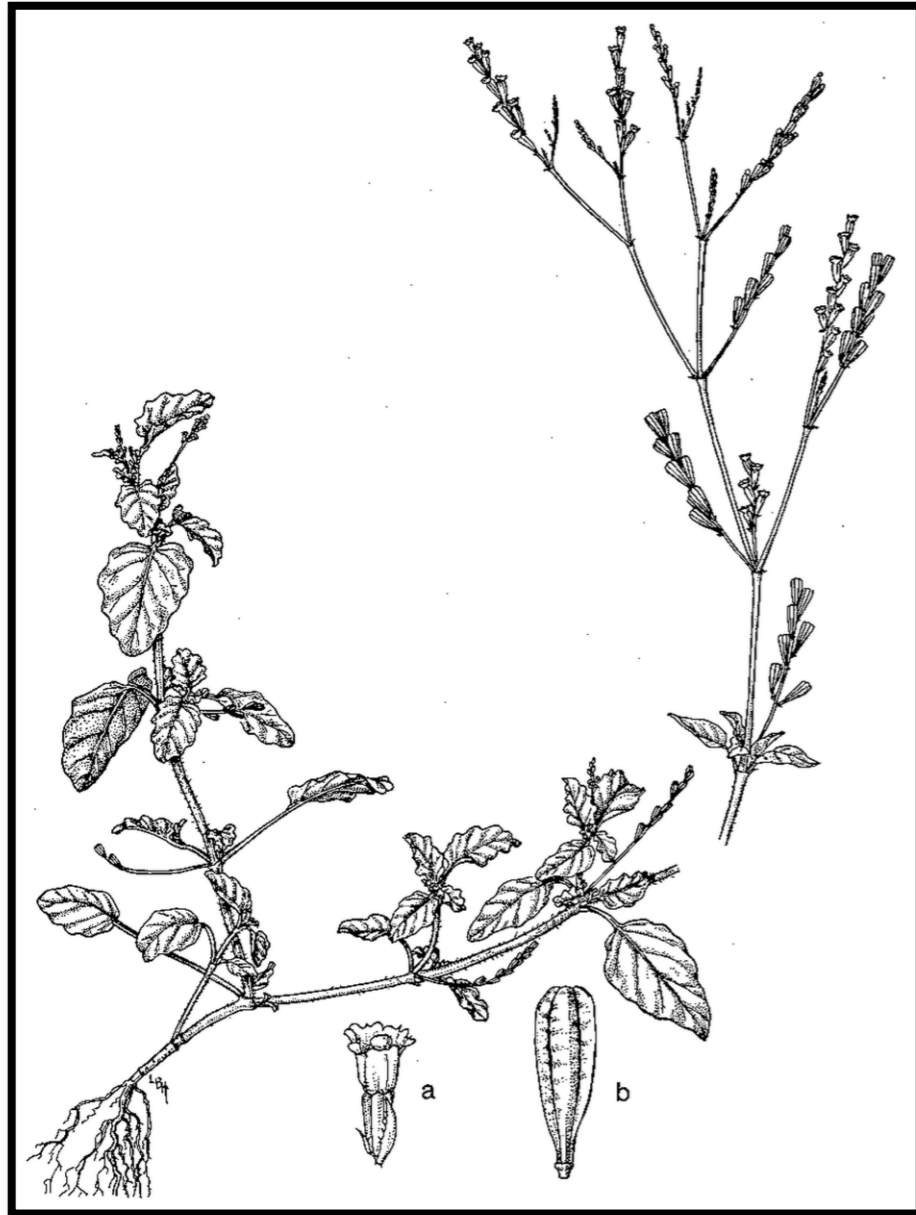
### Red Spiderling (*Boerhavia coccinea*) [P|DN]

More adventurous than Coulter Spiderling (next), Red Spiderling grows in many places around the world. Its origin is uncertain, but best guess is the U. S. Southwest. The leaves are attractive, and the flower is brilliant (best observed with your loop). The allelopathic plants emit powerful chemicals that block other weeds and secure sites for future growth. Control spiderlings with an occasional mow job (Fig. 9.23.2).

**Fig. 9.23.2** Red Spiderling flower cluster (photos © GR)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.23.3** Coulter Spiderling (*Boerhavia Coulteri*)—NYCTAGINACEAE. Annual reproducing by seed; erect 12-36in high or prostrate stems radiating outward 1-5ft and rising at the tips. Lower stem hairy, upper stem sometimes with sticky yellow bands at maturity. **Leaves:** Opposite, eggshaped, hairless except along stalks and sometimes edges, 1-4in long. Similar to Red Spiderling (cf.). **Flowers:** Pale pink, about 2mm long, solitary or in clusters of two or three, scattered along upper stems for 1-2in. **Fruits:** Wedgeshaped, hairless, about 3mm long with five ridges. **a.** Flower. **b.** Fruit (Fig. 9.23.3 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

### Coulter Spiderling (*Boerhavia Coulteri*) [A|FN]

This native annual blooms from mid to late summer. Like Red Spiderling, the flowers are attractive, but they are so small (2-4mm) you will need your hand lens to see them.

This is one of the least studied weeds in this book. There are photos and taxonomic descriptions on the Web, but I found nothing about the plant's value for wildlife or humans. If you find this plant interesting, you can contribute an article about it to the Encyclopedia of Life, and you could expand the stub article in Wikipedia (Fig. 9.23.4).

**Fig. 9.23.4** Coulter Spiderling (photo © Stan Shebs)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



## 9.24 EVENING PRIMROSE FAMILY—ONAGRACEAE



**Fig. 9.24.1** Velvet Gaura (*Oenothera curtiflora*)--ONAGRACEA. Annual 30-200cm tall, covered by soft long hair, branches near the top. **Leaves:** Basal cluster, alternate along stems, lanceolate 2-13cm long and 5-40mm wide. Small teeth line edges near the tip. **Flowers:** Small, asymmetrical, pale pink or white, self-pollinating, in 10-30cm long spikes at branch tips. The floral tube below the sepals is 1-5mm long, four drooping sepals 2-4mm long; four petals 2-3mm long. Petals fade to dark pink or red. **Fruits:** Woody capsule 5-10mm long with four angles, tapers to slender base. One to four oval seeds remain within the capsule (Fig. 9.24.1 photo © Mack Hitch)

Weeds of Dewey-Humboldt, Arizona

## Velvety Gaura (*Oenothera curtiflora*) [A|N]

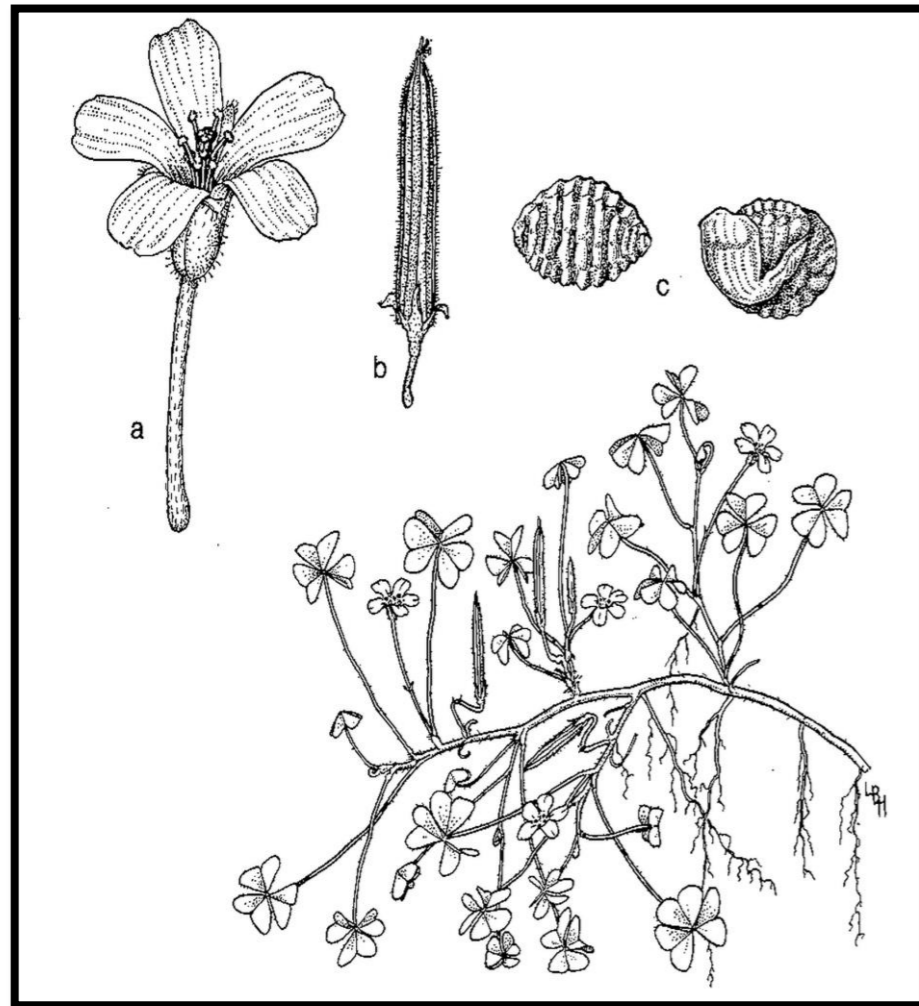
This tall native has distinctive, disorganized flower spikes extending up to a foot from its shoot tops. My next-door neighbor called it fireweed and claimed it caused rashes. However, the plant's dense hair coat is harmless and indeed feels like velvet (Fig. 9.24.2).



**Fig. 9.24.2** Enlarged section of Velvet Gaura flower spike (photo © Matt Lavin)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]

## 9.25 WOODSORREL FAMILY—OXALIDACEAE



**Fig. 9.25.1** Creeping Woodsorrel (*Oxalis corniculata*)—OXALIDACEAE. Prostrate with creeping stems 3-8in long. Reproduces from seed, stems rooting at joints, and from rhizomes. **Leaves:** Alternate leaves with *three heartshaped leaflets* at the tip of long leaf stalks. The green, purple, or bronze leaflets close and droop at night. **Flowers:** Five yellow petals 3-8mm long. One to five cluster at the end of stalks rising from leaf axils. Similar to Bullhead (below). **Seeds:** Tan seedpods are erect on bent stalks. They are cylindrical, 5-sided, 8-25mm long with pointed tips. When the 1mm long seeds mature, the pod bursts open shooting the many tiny brown hopefuls up to 10 feet. **a.** Flower. **b.** Seedpod. **c.** Two views of seed (Fig. 9.25.1 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

**Creeping Woodsorrel (*Oxalis corniculata*) [P|DE]**

We can live with this plant. A rare introduction from South America, Creeping Woodsorrel may have originated in the Andes Mountains of Ecuador. People have spread it around the globe; I once found it in Manhattan, NY growing beneath Yew shrubs in a small planter surrounded by twenty feet of concrete. The plant colonizes exposed soil and is persistent on the margins of lawns. It is present in shady moist sites throughout D-H. Dispersal is by exploding seedpods besides the common vehicles. Like the spurges and Plantago, much of Creeping Woodsorrel's foliage is below the bite of mower blades. Woodsorrel isn't competitive, however, and doesn't force its way between lawn grasses. The flower color and size resemble Bullhead, but the leaves are different. So check, because if it's Bullhead you will want to pull the monster before it makes seeds.

The deer, gophers, and occasional rabbit visiting my yard like to nibble Woodsorrel foliage, and the Deer mice, White-footed mice, Mourning Dove, Juncos, Field Sparrows, Grasshopper Sparrows, Savannah Sparrows, and Tree Sparrows eat the seeds. Bees, butterflies, and flies go for the flower nectar and pollen. Caterpillars of at least one species of the Cyna (*Zizula*) butterflies prefer these plants.

Every bit of this weed is edible, but don't eat bales of it because it contains some oxalic acid. It has a tangy flavor strongest in the stems and ripening seedpods (Fig. 9.25.2).

**Fig. 9.25.2** Creeping Woodsorrel flowers (photo © GR)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]

## 9.26 POPPY FAMILY—PAPAVERACEAE



**Fig. 9.26.1** Crested Pricklepoppy (*Argemone pleiacantha*)—PAPAVERACEAE. Broken leaves and stems exude yellow sap. Large white **flowers** 2-3in wide with 4-6 petals and many lemon-yellow stamens. **Leaves** are alternate, lobed, clasping at the base, and 2-8in long. **a.** Crested Pricklepoppy flower bud with three spiny terminal horns. **b.** Seedpod, 2-4cm long. **c.** Seed, 2-4mm in diameter. **d.** Bluestem Pricklepoppy plants are very similar to Crested Pricklepoppy, but Crested is actually blueer. Its flower buds have three terminal horns that lack spines except at base. (Fig. 9.26.1 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

**Crested Pricklepoppy (*Argemone pleiacantha*) [A-B|MN]**

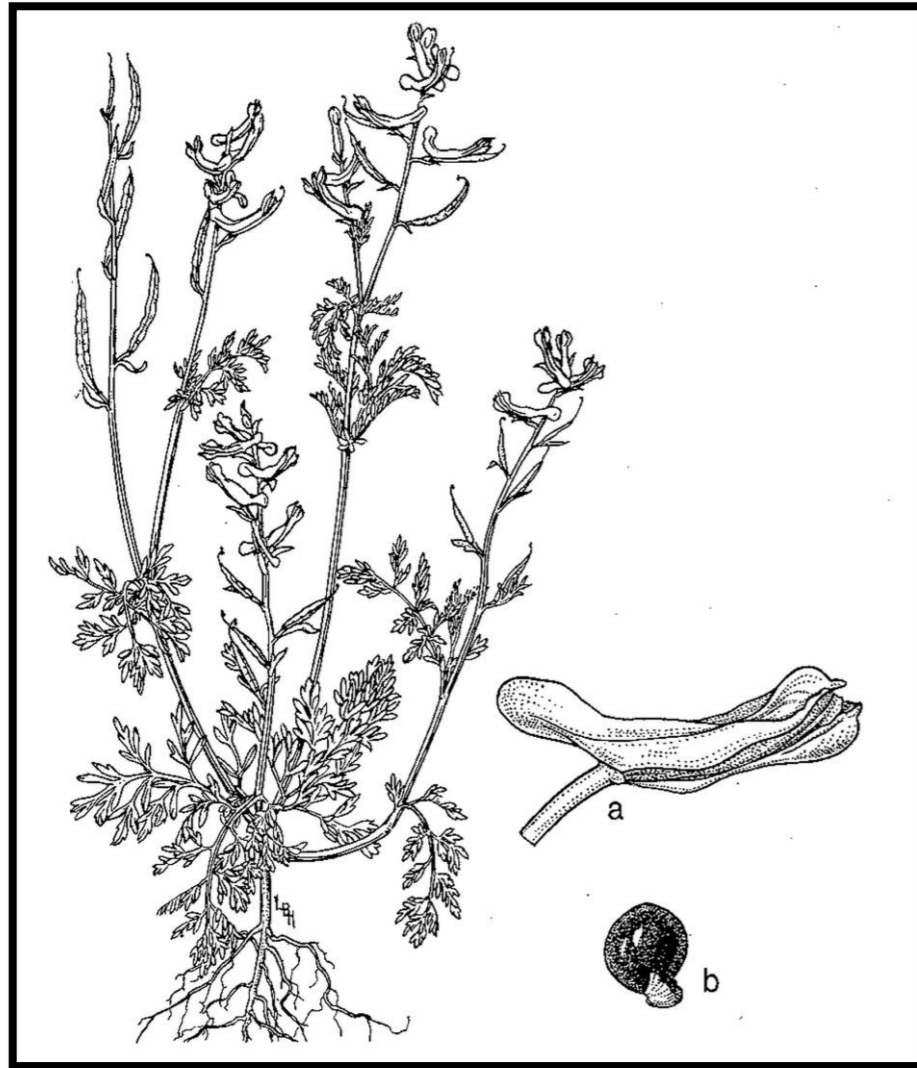
Pricklepoppy is a native of Arizona and the southern and western Great Plains. You can't miss them. They have large white flowers with bright lemon-yellow centers. Plants bloom from March to August and their fragrance attracts many ants, beetles, and butterflies (Fig. 9.26.2).

Though Pricklepoppy requires little moisture, it occupies depressions and roadside ditches where extra moisture collects. It is also common where heavy grazing eliminates grasses and other competitors and breaks up the soil surface. Why does this plant remain? Well, wait until you see it. It's very thorny; plus, if you break a branch, it bleeds a repugnant yellow sap that repels grazing animals. I like this comment by Michael More: "Often a symptom of fierce overgrazing, I have heard otherwise sentient, grizzled old ranchers fussily insist that the plant "chokes out the grass," while surveying their sad old pastureland covered only in plants that cattle can't eat. And hens mature into eggs" (Moore 2003: 210).

**Fig. 9.26.2** Crested Pricklepoppy (photo © GR)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.26.3** Golden Corydalis (*Corydalis aurea*)—PAPAVERACEAE. Low bluish green biennial reproducing by seeds. Stems contain watery juice. Branches often lay on the ground for a short distance and then grow upward. **Leaves:** Deep segmented lobes. **Flowers:** Bright yellow, 1-2cm long with spur at the base and two sepals. **Seeds:** Bluegreen cylindrical seedpods 13-25mm long curve downward. The plethora of shiny black seeds are about 2mm long. **a** Flower with spur. **b** Seed (Fig. 9.26.3 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### Golden Corydalis (*Corydalis aurea*) [B|N]

This is a native biennial weed. Scrambled Eggs is another common name, but I'm sticking with Golden Corydalis.

The weed is present throughout this region but I haven't seen it in D-H--yet. There are two variants: *Aurea* and *occidentalis*. *Aurea*'s fruit spreads or dangles and the flowers do not grow taller than the leaves. *Occidentalis*'s fruit is erect and the flowers grow taller than the leaves (photo below). The weed grows in the altitude range from 2,500-7,500ft in moist riparian areas. In the past, botanists reported *Occidentalis* prefers warmer conditions and grows between 2,500ft and 4,000ft. However, recent global warming has raised average temperatures almost 1.5 degrees Celsius. The adiabatic lapse rate being 1.5 degrees Celsius per 500ft, conditions in D-H are becoming suitable for *Occidentalis*. Those same botanists found *Occidentalis* preferred dry soil, which should give it an advantage in D-H and all other dry lands (Fig. 9.26.4).



**Fig. 9.26.4** Golden Corydalis (photo © Jerry Friedman)

## 9.27 PLANTAIN FAMILY—PLANTAGINACEAE



**Fig. 9.27.1** Buckhorn Plantain (*Plantago lanceolata*)—PLANTAGINACEAE. Small perennial 12-18in tall with thick fibrous roots; reproduces from seed. **Leaves:** Ribbed, 3-12in long, 6-25mm wide with pointed tips; leaf axils often filled with dense brown hair. **Flowers:** Spikes 2-5cm on stalks longer than the leaves. **Fruit:** Spherical, papery pods about 3mm long, upper half falls off to release seeds. Seeds about 2mm long, shiny, brown. **a.** Two views of boat-shaped seed (Fig. 9.27.1 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

## Buckhorn Plantain (*Plantago lanceolata*) [P|EFM]

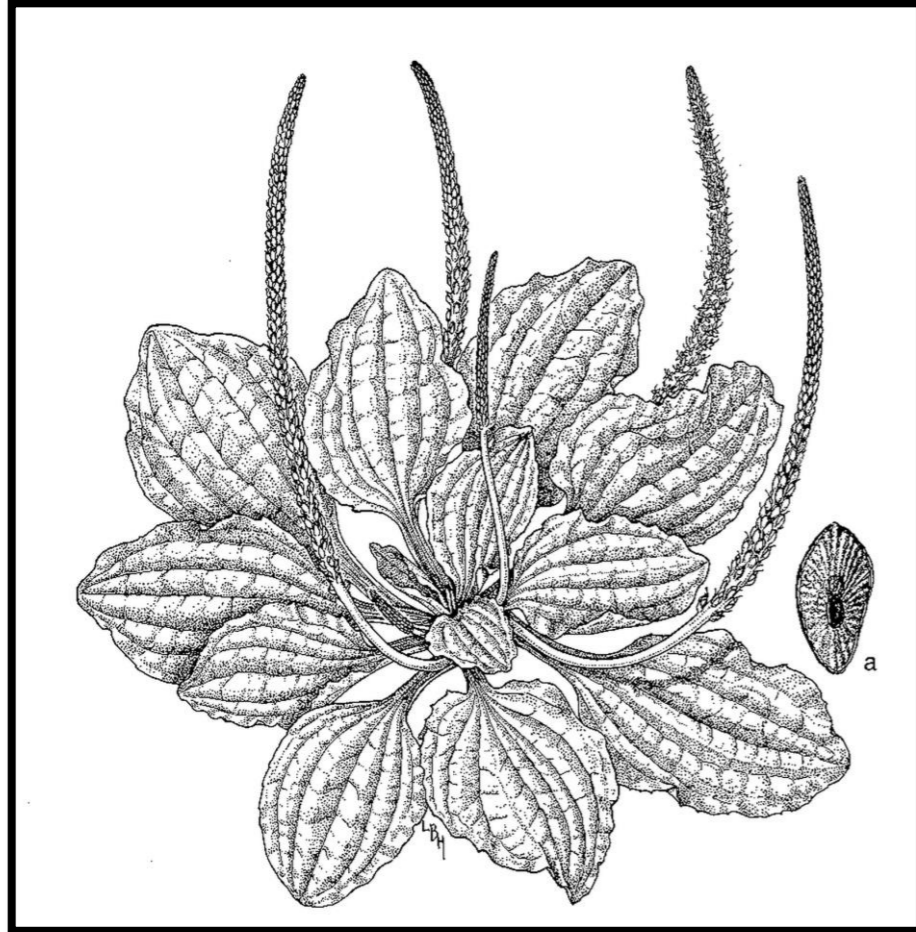
Buckhorn Plantain's origin isn't clear in the literature. It has a long history in both Eurasia and N. Africa, and pollen analysis shows it followed the spread of Neolithic farmers. Today it grows in temperate habitats worldwide. Like its big-leafed cousin (Broadleaf Plantain), Buckhorn Plantain prefers moist sites and colonizes roadsides and watered lawns and gardens. I've seen it beside the river. Native Americans and others use the plant to remedy headaches, dysentery, poisonous bites, stings, burns, blisters, sore eyes, bowel complaints, earaches, and hungry cows. Moore (2003) describes additional uses and provides details on collection and preparation.

Wind, beetles, and flies spread the sneeze-inducing pollen of Buckhorn Plantain throughout spring and summer (Fig. 9.27.2).

**Fig. 9.27.2** Buckhorn Plantain (photo © Sanrise)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.27.3** Broadleaf Plantain (*Plantago Major*)—PLANTAGINACEAE. No aboveground stems. Leaves 3-8in on stalks 2-5in long and 2-4in wide, 5-7 ribs and smooth wavy to toothy margins. Flower spikes 3-12in long. The small four-lobed flowers are thin, pale, dry, and persistent. Seedpods globular, 3mm long with 6-20 seeds 1-2mm long (Fig. 9.27.3 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### Broadleaf Plantain (*Plantago major*) [P|EM]

This Eurasian perennial appears in moist locations in D-H and in most of the world. It forms a strong root system, and though it can sprout from its roots, it reproduces mainly by seed. Broadleaf Plantain in lawns adds texture and diversity perfectionists detest. It's too flat to the ground to mow, so pulling or poisoning are the options (Fig. 9.27.4). The plant has beneficial uses ranging from salad greens to pain relief to cough medicine and many more. If you want to learn to use *Plantago* and other plants for natural medicine, read Michael Moore's *Medicinal Plants of the Mountain West* (Moore 2003).

**Fig. 9.27.4** Photo © Jesse Taylor





**Fig. 9.27.5** Yellow Toadflax (*Linaria vulgaris*)--PLANTAGINACEAE. Perennial 30-80cm tall forms patches by sprouting from roots. **Leaves:** Alternate, pale green, 2-5mm wide; *not clasping like Dalmatian Toadflax*. **Flowers:** Yellow with orange centers, 2-4cm long including nectar spurs. **Fruit:** Round, 8-12mm wide capsule containing numerous small brown winged seeds (Fig. 9.27.5 painting by Norman Criddle 1909)

### Yellow Toadflax (*Linaria vulgaris*) [P|IT]

A European native, Yellow Toadflax is a common garden flower across the U. S. However, this weed is a serious threat to native vegetation. The plants produce extensive root systems from which new shoots arise when there is sufficient moisture for growth. The roots can lie dormant for up to 10 years. Once established in native vegetation, control becomes exceedingly difficult (Fig. 9.27.6).

**Fig. 9.27.6** Yellow Toadflax  
(photo © Jeff DeLong)





**Fig. 9.27.7** Dalmatian Toadflax (*Linaria dalmatica*)--PLANTAGINACEAE. Three-foot tall perennial sprouts from a deep spreading root system. **Leaves:** Crowded on stem, ovate, sharp tips, and *clasping at the base*. **Flower:** Five lobed, two lipped, bright yellow corolla 2-5cm long with a spur at the base (Fig. 9.27.7 photo © Peganum)

### Dalmatian Toadflax (*Linaria dalmatica*) [P|ITZ-2]

Many people have planted this alien perennial weed in their yards for the bright yellow snapdragon-like flowers. As time passes, however, the flowers magically appear everywhere in your yard, along the street, and in the neighbors' yards. This is not a problem in yards and gardens; yearly mowing suffices to maintain control.

However, such intense management is not practical across miles and miles of the pinyon-juniper woodlands and Ponderosa Pine Forest where Dalmatian Toadflax has spread. There, the plant competes with and replaces native grasses and wildflowers. It spreads into areas where livestock have thinned out native plants and broken up the soil surface. Once established, Dalmatian Toadflax will not readily give up its place. Each plant produces up to 500,000 seeds that stay viable in the soil for 10 years or more (Robocker 1968). Roots remain viable for even longer. In the Coconino National Forest northeast of D-H, Dalmatian Toadflax has invaded more than 200,000 acres.

Common Buckeye Caterpillars (*Junonia coenia*) eat Toadflax. Perhaps a swarm will thin out the plants out in the woods next spring. We can always use more butterflies (Fig. 9.27.8).

**Fig. 9.27.8** Dalmatian Toadflax. Pods opening reveal seeds (photo © GR)





## 9.28 GRASS FAMILY—POACEAE



**Fig. 9.28.1** Wild Oats (*Avena fatua*)—POACEAE. Annuals 8-160cm tall. **Leaves:** Sheaths of basal leaves with scattered hair; upper sheaths hairless; ligules 4-6mm long, pointed; blades 10-45cm long and 3-15mm wide. **Flowers:** Nodding, panicles 7-40cm long and 5-20cm wide. **Seeds:** Two or more spikes extend from each seed. (Fig. 9.28.1 painting by Norman Criddle in Clark and Fletcher 1909)

Weeds of Dewey-Humboldt, Arizona

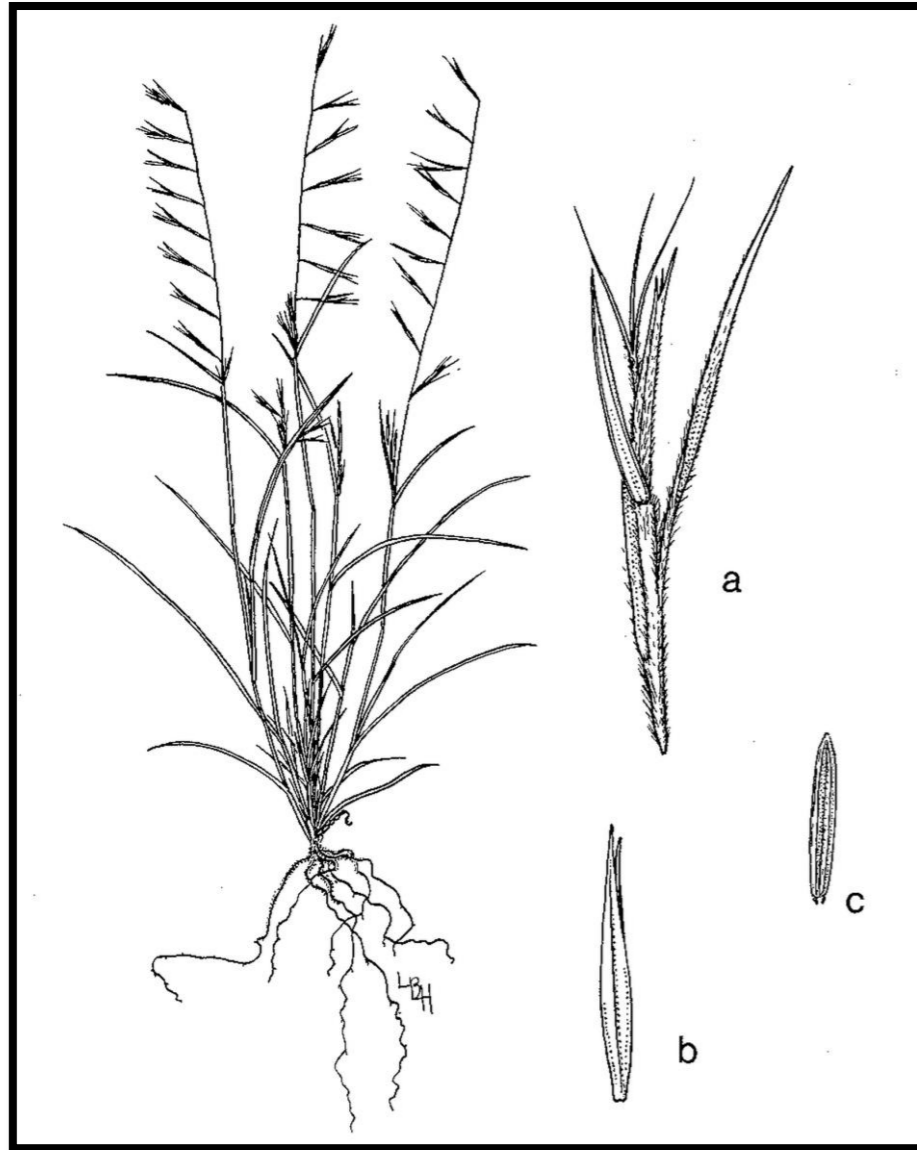
**Wild Oats (*Avena fatua*) [A|EM]**

You can often see big-seeded Wild Oats from the car window as you whiz along. Is this roadside vagrant the archetype for the wild behavior of youth? *Fatua* is Latin for foolish, insipid, or worthless. But what is it about this plant that caused Linnaeus to label it worthless? Its genus, *Avena* is Latin for oats and the seeds are large and edible; why is the plant a weed and not a commercial field crop? In fact, Wild Oats is in commercial oat fields around the world, but not by design. The plant invades *Avena sativa* (*sativa* means domestic or planted) crops where it reduces overall productivity by using water and soil nutrients to make more leaves but fewer seeds than *sativa*. I guess from the human point of view, this is foolish. However, Kane and Moore report above average medicinal uses for Wild Oats. So, not too worthless (Fig. 9.28.2).



**Fig. 9.28.2** Wild Oat spikelets (photo © Alvesgaspar)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



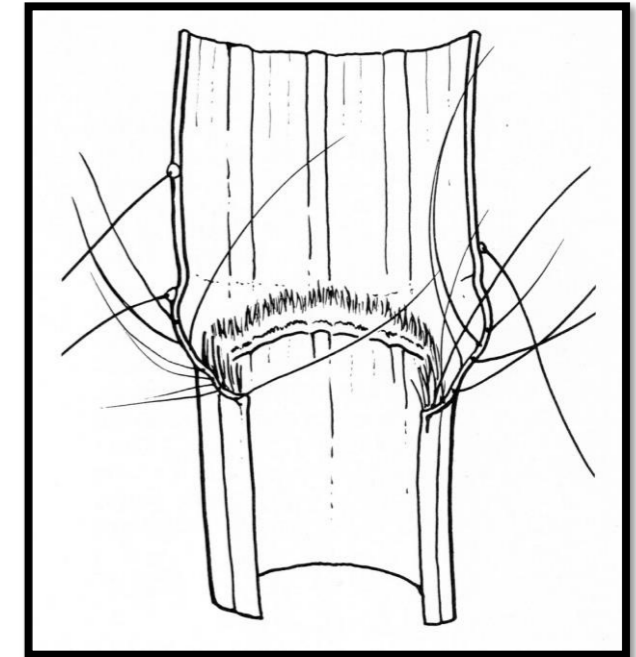
**Fig. 9.28.3** Sixweeks Needle Grama (*Bouteloua aristidoides*)--POACEAE. Small short-lived annual 3-12in tall, reproducing by seeds. **Leaves:** Thin, 3-6in long and 2mm wide; ligule hairy, small 1-2mm, membranous and lacerate or ciliate. **Flowers:** 4-20 spikes with pointed bases and spreading tops, 1-2cm long. Loosely attached along one side of the stem; each with three short bristles about 5mm long. **Seed:** Brown, about 3mm long. **a.** Two spikelets. **b.** Lowest spikelet. **c.** Grain (Fig. 9.28.3 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

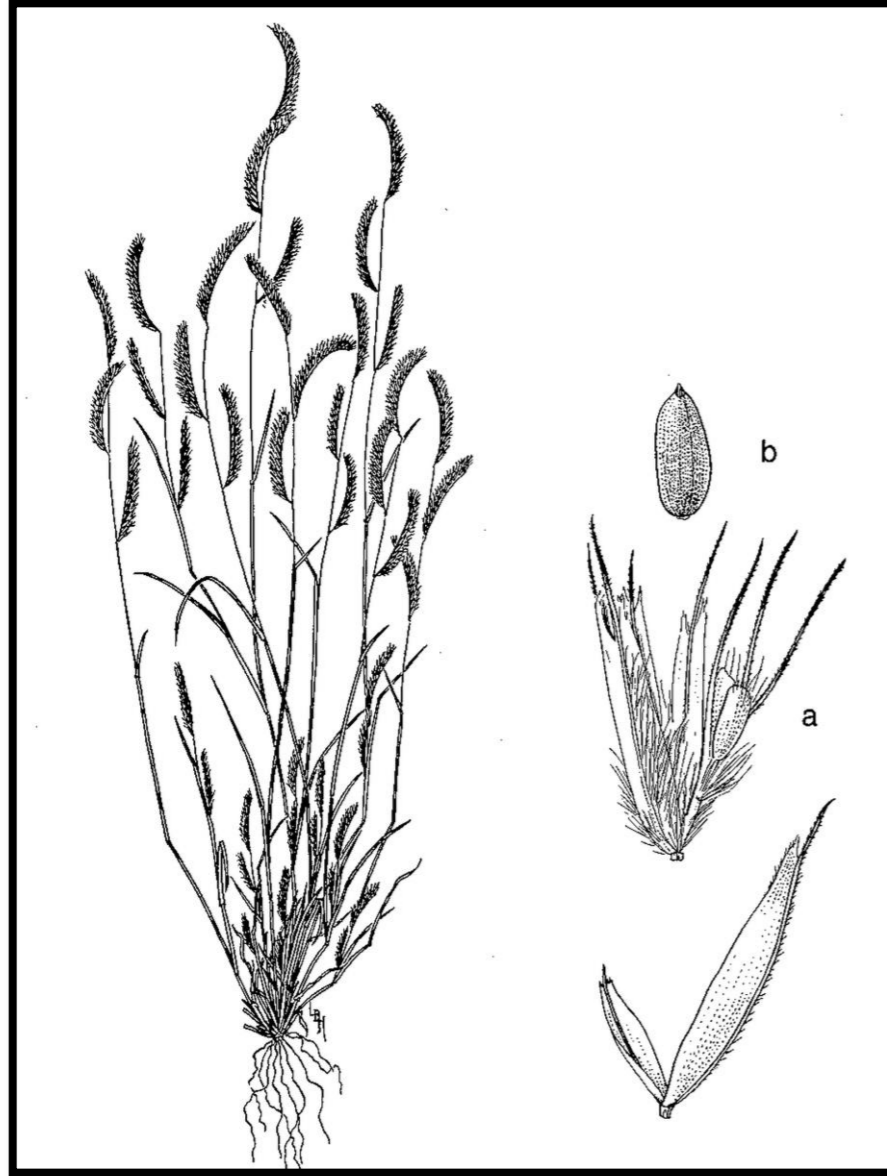
### Sixweeks Needle Grama (*Bouteloua aristidoides*) [A|P]

This species has about the same distribution as Sixweeks Grama, but is the more abundant of the two in D-H (Fig. 4.28.4).

**Fig. 9.28.4** Open sheath, collar, hairy ligule, and blade of Sixweeks Needle Grama (Copple and Pase 1967. U. S. Forest Service)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



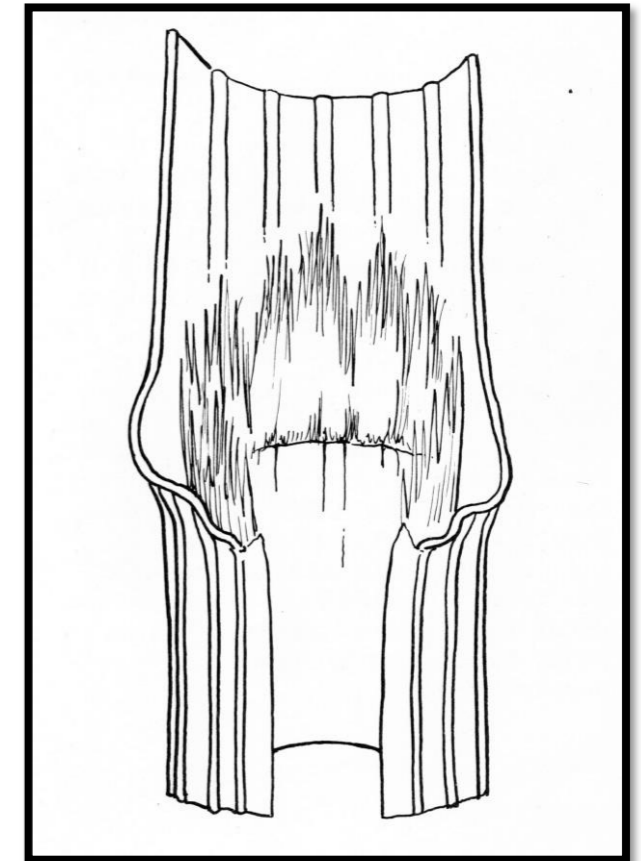
**Fig. 9.28.5** Sixweeks Grama (*Bouteloua barbata*)--POACEAE. Annual 1-75cm tall, prostrate or erect, some roots from lower nodes. **Leaves:** Hairless sheaths except for tufts of long hairs on both sides of collars; ligules .1-1mm, ciliate; blades 5-10mm long, 1-4mm wide. **Flowers:** Panicles 7-25mm with 2-10 branches 10-30mm long with 20-50 spikelets. Each head ending in well-defined spikelet. **a.** Spikelet with fertile and sterile flowers with the separated glumes below. **b.** Grain (Fig. 9.28.5 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

### Sixweeks Grama (*Bouteloua barbata*) [A|DN]

For me, the *Boutelouas* are the grasses of the Southwest. Sod-forming perennials and ruderal annuals, they are a vital element of native ecosystems. Their leaves and seeds feed birds, small mammals, and ants. Alien introductions such as Red Brome will replace many of them, but some could survive. Three of them including Sixweeks Grama, its close relative, Rothrock Grama (*B. rothrockii*), and painful Sixweeks Needle Grama (*B. aristoides*), described above, tolerate the heat of the Sonoran Desert and the freezes of the middle elevations around D-H. All three might persist while many other grasses decline or disappear altogether (Fig. 9.28.6).

**Fig. 9.28.6** Sixweeks Grama sheath, collar, ligule, blade (drawing by Copple and Pase 1967. U. S. Forest Service)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.28.7** Rescue Brome (*Bromus catharticus*)—POACEAE. Annual or biennial 6-36in high reproducing only from seed. **Leaves:** Flat 3-8mm wide; ligules long, up to 5mm, unfringed, but with some teeth. **Flowers:** Panicle 9-28 cm long with spikelets 2-4cm long with 5-12 florets. **Grain:** about 1cm long. Distinguished from other bromes by the flattened spikelets and short or absent awns. **a.** Spikelet. **b.** Grain (Fig. 9.28.7 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### Rescue Brome (*Bromus catharticus*) [A-P|E]

This South American native is now present around the world. Also known as rescuegrass and prairie grass, Rescue Brome does well in dry locations. Though it is not tolerant of fire, its fine fuel production qualifies it as a member of the fuelweed group responsible for decreasing fire-return intervals and wiping out native species in arid western North America. Though not as prolific as cheatgrass, it acts as a supporting character in the war on biodiversity loosed by humanity. It invades lawns and gardens, but regular mowing or pulling will give you control.



**Fig. 9.28.8** Rescue Brome spikelets (photo © Forest and Kim Starr)



**Fig. 9.28.9** Red Brome (*Bromus madritensis* ssp. *rubens*)—POACEAE. Annual grass 10-40cm tall. **Leaves:** Sheaths hairy, ligule 1-4mm, hairy, pointed with smooth edges, blades to 15cm long and 1-5mm wide, flat, hairy top and bottom. **Flowers:** Panicles 2-10cm long and 2-5cm wide, reddish brown; spikelets 18-25mm with 4-8 florets, lower glumes hairy 5-8mm, upper glumes hairy 8-12mm, 3-5 veins; lemmas 10-15mm hairy; awns 8-20mm; awns 2cm long, curving as plant dries (Fig. 9.28.9 photo U. S. National Park Service)

### Red Brome (*Bromus madritensis* ssp. *rubens*) [A|I]

This European annual is abundant west of the Rocky Mountains. It flourishes in the Arizona Uplands of the Sonoran Desert and the semiarid uplands of central Arizona and southern California. Like its cousin, Cheatgrass, Red Brome is a winter annual that completes its lifecycle by late spring, dries out, and stands waiting for a spark to burn in a hot flash across the land. It isn't the worst fuel plant in the region, Buffelgrass (*Cenchrus ciliaris*) invading the desert south of D-H claims that honor, but when combined with other alien weeds, Red Brome is a significant contributor to destructive wildfires (Fig. 9.28.10).



**Fig. 9.28.10** maturing Red Brome behind town hall (photo © GR)



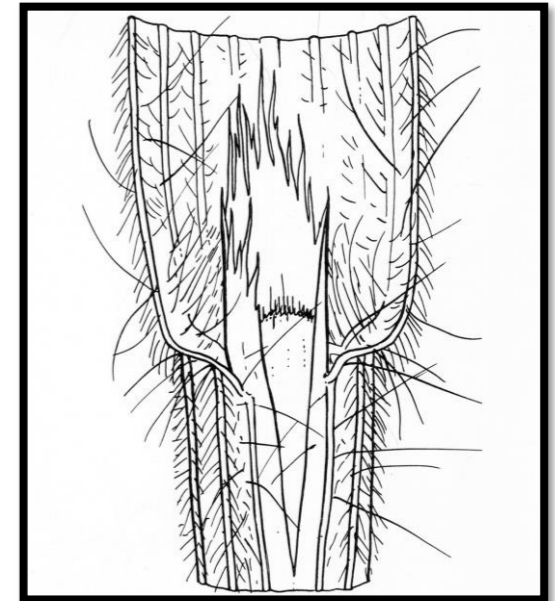
**Fig. 9.28.11** Cheatgrass or Downy Brome (*Bromus tectorum*)—POACEAE. Erect stems. **Leaves:** Hairy with 2-3 veins on each side of the midrib; ligule small 1-2mm, hairless, membranous, obtuse-lacerate. **Seeds:** Heads drooping with maturity with 1-2cm long awns on the lemma (Fig. 9.28.11 drawing Hitchcock and Chase 1950, public domain)

### Cheatgrass (*Bromus tectorum*) [A|IP]

Shoes become bushy during a summer stroll through a field of Cheatgrass. Designed for mammal dispersal, the plant's rough seeds burrow between shoelaces, around shoe tongues, and into socks where they poke and scratch. However, they don't generate the emergency reaction of the larger harder seeds of Ripgut Brome described next.

The ecological pain caused by Cheatgrass is much greater than the physical pain it administers to animals. This Eurasian annual germinates in winter or early spring and completes its life cycle by early summer. Through the rest of the summer and early fall it stands crispy dry ready to burn. Ignitions come from lightning, campfires, trains, careless smokers, and hot car mufflers. Once ignited, cheatgrass fires devour the land with intense heat that kills soil organisms, and ignites herbs, shrubs, and trees. A botanical irony, many cheatgrass seeds survive the fire. The seeds germinate the next spring and produce new plants and more seeds wind and mammals spread across surrounding areas. After a few years and a few fires, almost nothing but Cheatgrass remains. This fire-resistant little grass has depleted biodiversity and productivity of millions of acres of native vegetation in the western U. S.

Enterprising American ranchers further deplete diversity by trucking in cattle to graze cheatgrass ranges in spring and then trucking the cows out as soon as the grass dries in early summer. Wildlife and feral horses struggling to survive on the impoverished land find and consume every plant on every fireproof rocky mound leaving few native plants for future recovery (Fig. 9.28.12).



**Fig. 9.28.12** Cheatgrass sheath, collar, ligule, and blade (drawing by Copple and Pase 1967. U. S. Forest Service)



**Fig. 9.28.13** Ripgut Brome (*Bromus diandrus* ssp. *rigidus*)—POACEAE. Annual with smooth stems and hairy sheaths and blades. **Leaves:** Blades 3-6mm wide; ligule 2-5mm, tattily toothed. **Flowers** 10-20cm on branches bearing one or two flower spikelets 3-4cm long. Awns 3-6cm long. **Fruit:** Ellipsoidal, grooved caryopsis hairy at apex. Tiny barb-like hairs that point backwards cover the seeds, allowing them to catch anything brushing by. Movement works the sharp-pointed seeds into fur, skin, and even eyes (Fig. 9.28.13 photo © Matt Lavin)

### Ripgut Brome (*Bromus diandrus* ssp. *rigidus*) [A|IP]

This is the most painful grass I've encountered. Unfortunately, it has claimed the area beneath the Cottonwood trees along the river. It germinates in early spring and covers the ground beneath the trees with lush waves of green that give no hint of the agony to come. The seed heads mature in May. Thereafter, the river is almost safe from marauding humans. One person who I repeatedly asked to use the streets for his walks and leave the river woods for wildlife was self-important enough to grumble even with his snow gaiters on, the grass was too painful for pleasant walks anyway.

Ripgut in yards and gardens is easy to control by mowing and pulling. Periodic floods deposit rocks and debris over the river pasture and make mowing almost impossible. I wear snow gaiters when I want to spend time in that pasture during summer (Fig. 9.28.14).

I do not know for sure Ripgut seeds harm wildlife, but I hope most furry creatures have learned how to avoid the seeds or how to remove them.



**Fig. 9.28.14** Ripgut Brome and Cheatgrass (*Bromus tectorum*). Revegetation of disturbed natural areas is labor intensive and often fails because of the relentless arrival of invasive weeds (photo © Matt Lavin)



**Fig. 9.28.15** Field Sandbur (*Cenchrus spinifex*)—POACEAE. Spreading annual forms mats 4-36in wide with ascending leaves and flower spikes. **Leaves:** Two to five inches long; ligule ciliate, membranous base very short, collar margins villous (long soft straight hair). **Flowers:** Spikes 4-10cm, often partly enclosed by upper leaf sheath and holding 3-15 loosely arranged burs but some with 20-30 tightly packed burs. **Seeds:** Spiny, hairy, yellowish burs, about 13mm long, contain two seeds. Up to 500 burs per plant. **a.** Bur with spikelets **b.** Top and bottom views of grain. **c.** Bur from the similar Southern Sandbur (*Cenchrus echinatus*) that may not reach D-H until the climate warms more (Fig. 9.28.15 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

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### Field Sandbur (*Cenchrus spinifex*) [A|P]

This grass forms seeds with sharp spines that can exceed one-half inch. Not as terrible as Bullhead perhaps, but right up there. The first time I encountered Field Sandbur, I was wearing rubber wader boots while fixing an aerator line in a pond. After walking up the bank from the pond, I noticed seeds stuck to one boot. I brushed them off with a bare hand—yikes!—experience is a great teacher. The red of the young burs in the photo below is an appropriate warning (Fig. 9.28.16).



**Fig. 9.28.16** Field Sandbur fruit (photo © Macleay Grass Man)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]





**Fig. 9.28.17** Feather Fingergrass (*Chloris virgata*)—POACEAE. Slender spreading annual 6-40in high. **Leaves:** Blades 2-8cm long, with upper leaf bases wrapped around immature flower heads. **Ligule:** Membranous, 1mm, truncate ciliate. **Flowers:** Two to ten soft feathery spikes 2-8cm long arising from stem tips. Each spikelet has a tuft of long soft hair and very slender bristles 6-10mm long. Spikelets crowded in two rows along one side of the spike stem. **a.** Spikelet, glume detail below (Fig. 9.28.17 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

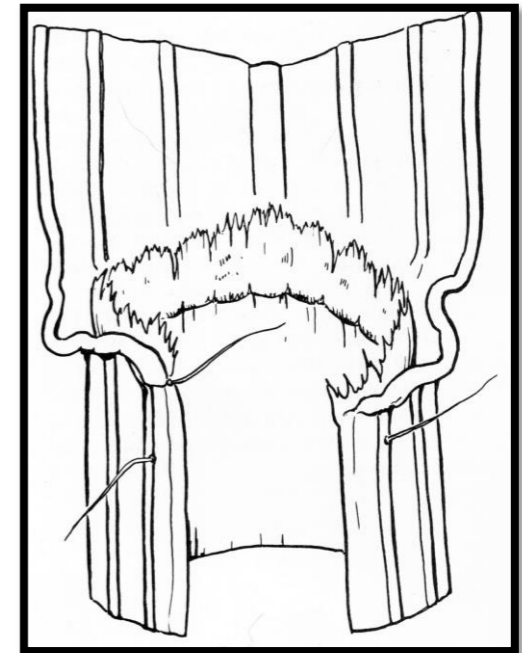
### Feather Fingergrass (*Chloris virgata*) [A|N]

This native annual grass has spread worldwide to regions with hot summers. People carried the plant to Australia, but botanists believe it must have dispersed across the oceans to other regions before people built seafaring ships. Such long-range dispersal is rare, but not impossible (Ridley 1930). One force for dispersal of small seeds like Feather Fingergrass is wind. Unusual winds can carry seeds aloft for great distances. Likewise, naturalists have reported rafts of matted water plants far from land carrying grasses, shrubs, and even small trees. Through the millions of years since the grasses appeared, such long-distance transport must have occurred thousands of times.

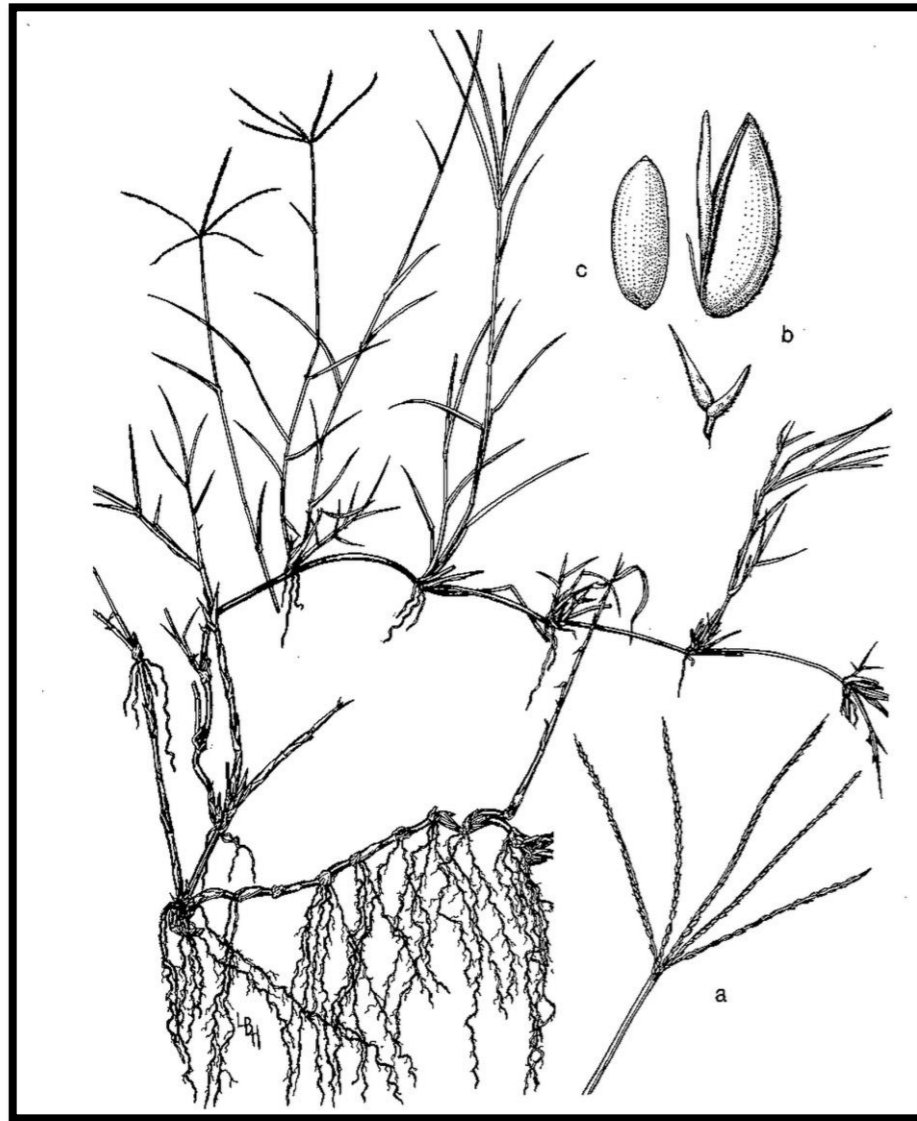
Bermudagrass (next species) resembles Feather Fingergrass, but Bermudagrass is smaller and perennial with many aboveground stolens and belowground rhizomes.

Feather Fingergrass is an excellent colonizer. Like magic, it spreads into disturbed areas including lawn margins, gardens, cultivated fields, roadsides, stream channels, and overgrazed livestock ranges (Fig. 9.28.18).

**Fig. 9.28.18** Feather Fingergrass sheath, collar, ligule, blade (drawing by Copple and Pase 1967. U. S. Forest Service)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.28.19** Bermudagrass (*Cynodon dactylon*)—POACEAE. Plants spread by runners atop the ground that root at their joints. Pointed rhizomes spear along underground. **Leaves:** 1-4 inches long. The ligule 1mm long, a circle of white hair with scattered long hairs. **Flowers:** On stalks form 4-18 inches high with 3-5 fingerlike spikes. Tiny overlapping spikelets appear in two rows on one side of the spike. **Seeds:** Tiny oval grain is red or straw colored. **a.** Enlarged inflorescence. **b.** Seed with glumes detached below. **c.** Grain (Fig. 9.28.19 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### Bermudagrass (*Cynodon dactylon*) [P|DT]

Bermudagrass forms thick turf on Caribbean islands but is a newcomer there as it is in lawns throughout Arizona. Botanists believe the grass originated in China.

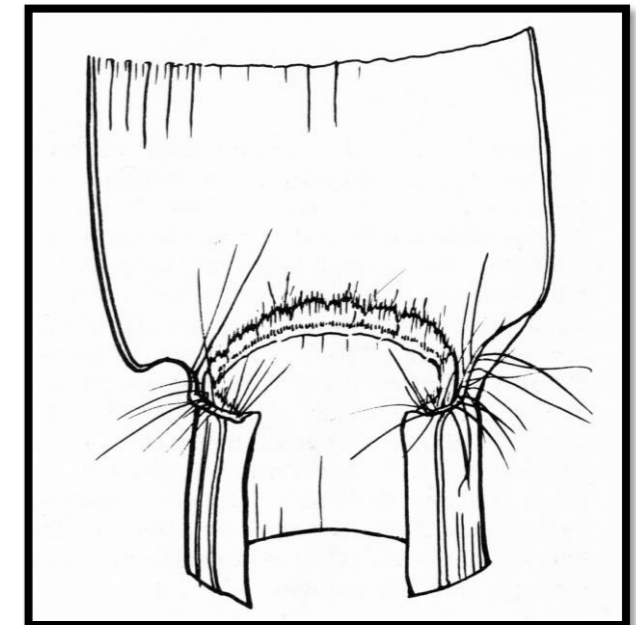
Bermudagrass is so tough some people call it Devil Grass. It is a problem if it gets established where you don't want it. Its roots go deep. They will send up new shoots long after you've removed all the aboveground parts. And you can't use the aboveground parts, the stolens, for mulch; with the next rain or irrigation, the stolens will form new roots and resume growth.

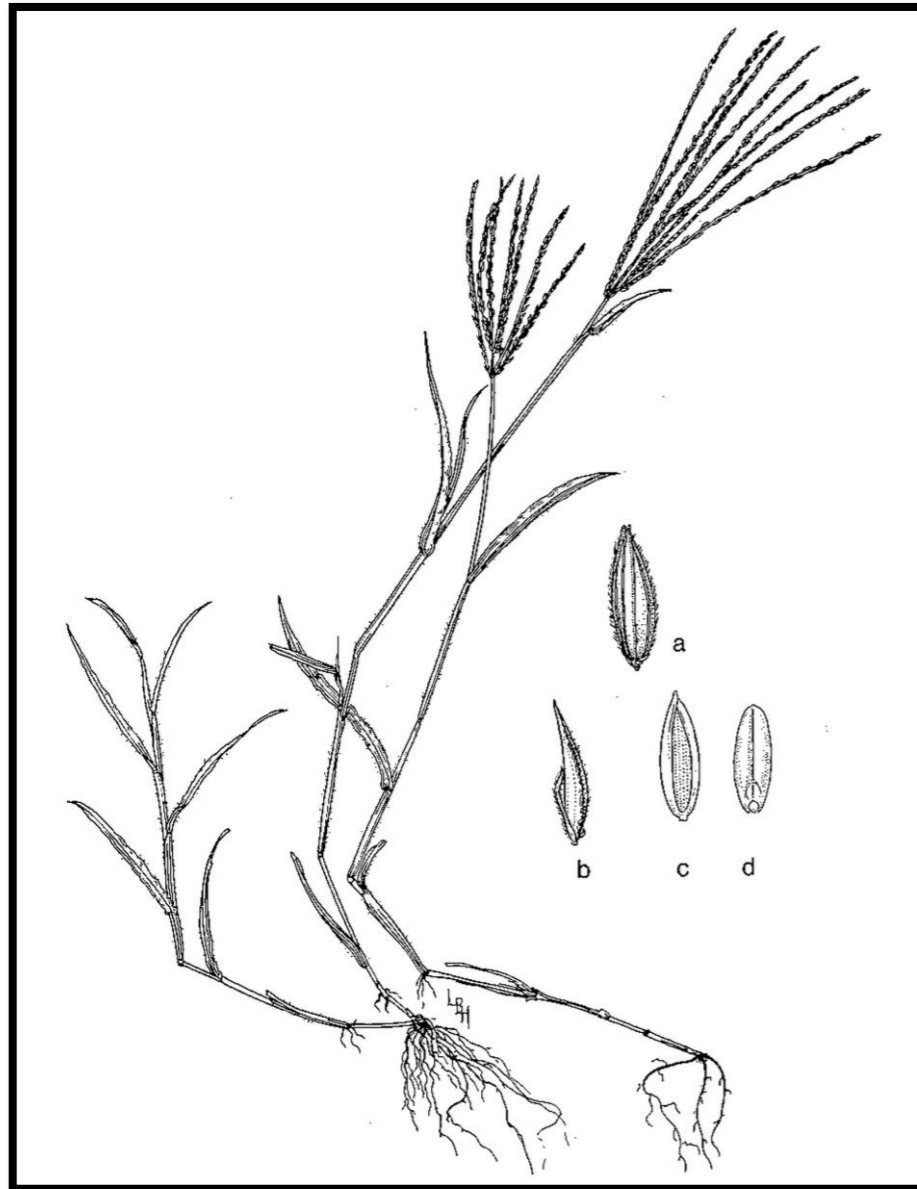
Bermudagrass makes a fine ground cover that needs almost no care. It does well under eves where rainwater concentrates, and it will grow in other places where it catches a little overshoot from lawn sprinklers. Butterflies and Damselflies find the grass interesting, and Crocuses do well in Bermudagrass lawns. The bulbs flower before the grass shakes its winter depression and they mature by time to mow. Gophers and Javelina love the bulbs from which these flowers grow, but they always leave some for next spring (Fig. 9.28.20).

Some people have a mild itchy reaction to Bermudagrass, but soap and water cures the itch. SEINet says the leaves are rich in vitamin C and make a fine herbal tea. I haven't tried the tea, but I know dogs and cats eat the leaves.

**Fig. 9.28.20**

Bermudagrass sheath, collar, ligule, blade (drawing by Copple and Pase 1967. U. S. Forest Service)





**Fig. 9.28.21** Large Crabgrass (*Digitaria sanguinalis*)—POACEAE. Branching annual reproduces by seed and by rooting from lower joints of spreading stems. **Leaves:** Flat blades 6-8mm wide. Sheaths with long stiff hairs. Ligules membranous, truncate, erose (irregularly toothed) 0.5-2.5mm long. **Flowers:** Three to eleven slender fingerlike branches 2-6in long have small spikelets 3-6mm long that hug the branch. **Seed:** Pale yellow, oval, about 2mm long (Fig. 9.28.21 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

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### Large Crabgrass (*Digitaria sanguinalis*) [A|T]

Large Crabgrass requires moist soil. It colonizes lawns, banks of the Agua Fria River, and low spots where water collects. Plants form a basal rosette of leaves low enough to escape mower blades. If you need a perfect lawn, pull the plants or dig them up (Fig. 9.28.22).



**Fig. 9.28.22** Large Crabgrass (photo © Rasbak)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.28.23** Barnyard Grass (*Echinochloa crus-galli*)—POACEAE. This strong summer annual matures anywhere from 6in to 72in tall and often spreads from its base to form large clumps. The leaves are 4-20in long and 6-20mm wide; *ligules absent*, ligule region sometime hairy. Flowering occurs along the top 3-10in of the stem. Flowering branches are 1-2in long with short green or purple spikelets 3mm long with bristles up to 4cm long. A single plant can produce 40,000 of the pale yellow shiny seeds. **a.** Spikelet spread open. **b.** Two spikelets with short and long awns. **c.** Grain (Fig. 9.28.23 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

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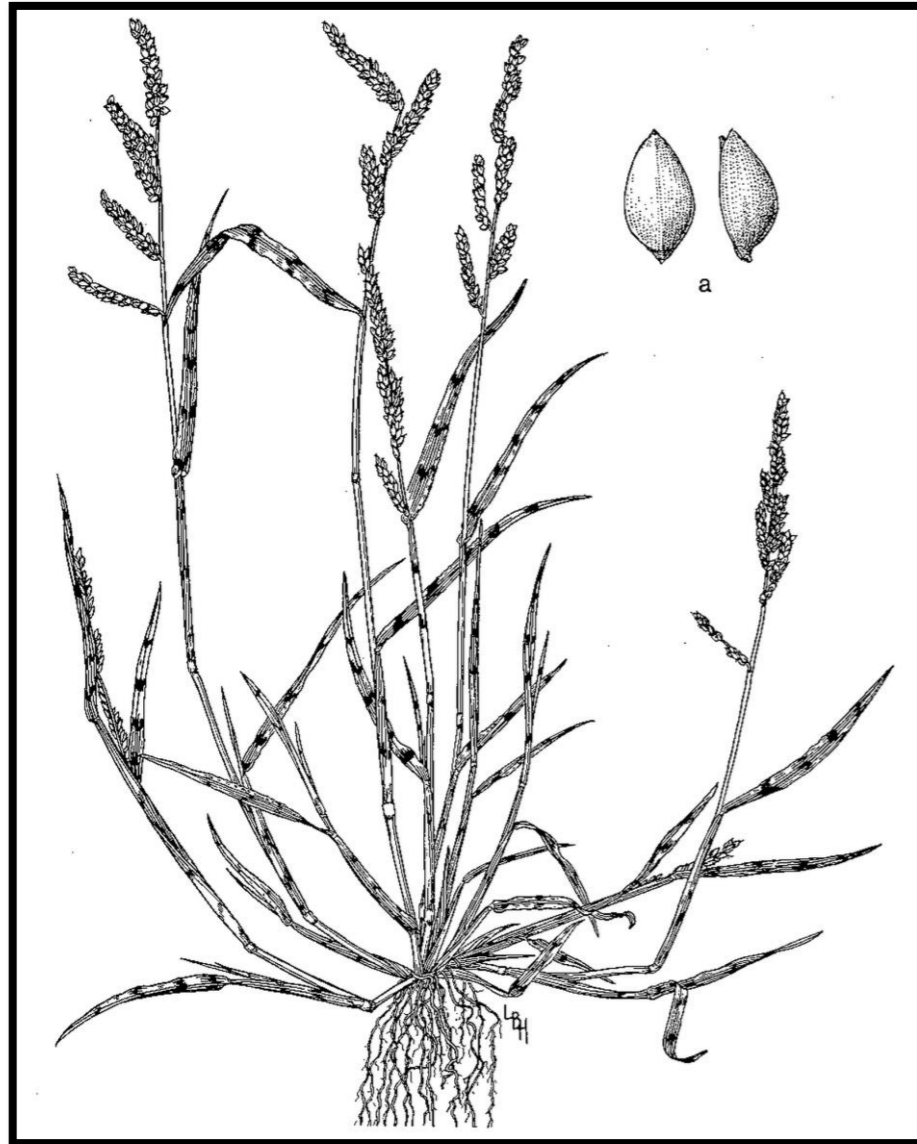
### Barnyard Grass (*Echinochloa crus-galli*) [A|D]

Farmers detest this European grass for its ready invasion and persistence in most crops. A single plant can produce 40,000 seeds. In the arid climates, the plant survives along moist stream banks and in moist spots beside roads, lawns, and gardens. Here, the plant is easy to control by mowing, pulling, or withholding water. However, if you allow a few clumps to grow, you will get to enjoy watching the acrobatics of Lesser Goldfinches that relish Barnyard Grass seeds. The small birds hang (often upside down) on drooping seed tops removing mature seeds until all are gone. The birds must drop seeds, however, as new plants appear in the same spots every year (Fig. 9.28.24).

**Fig. 9.28.24** Barnyard Grass with Lesser Goldfinch showing his tail feathers (photo © GR)



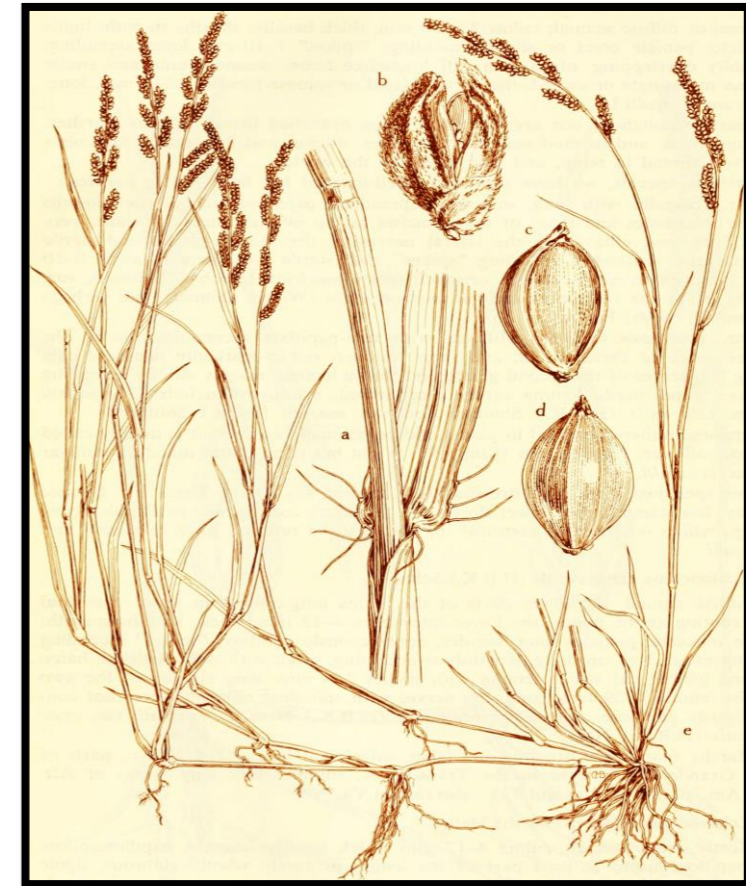
[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



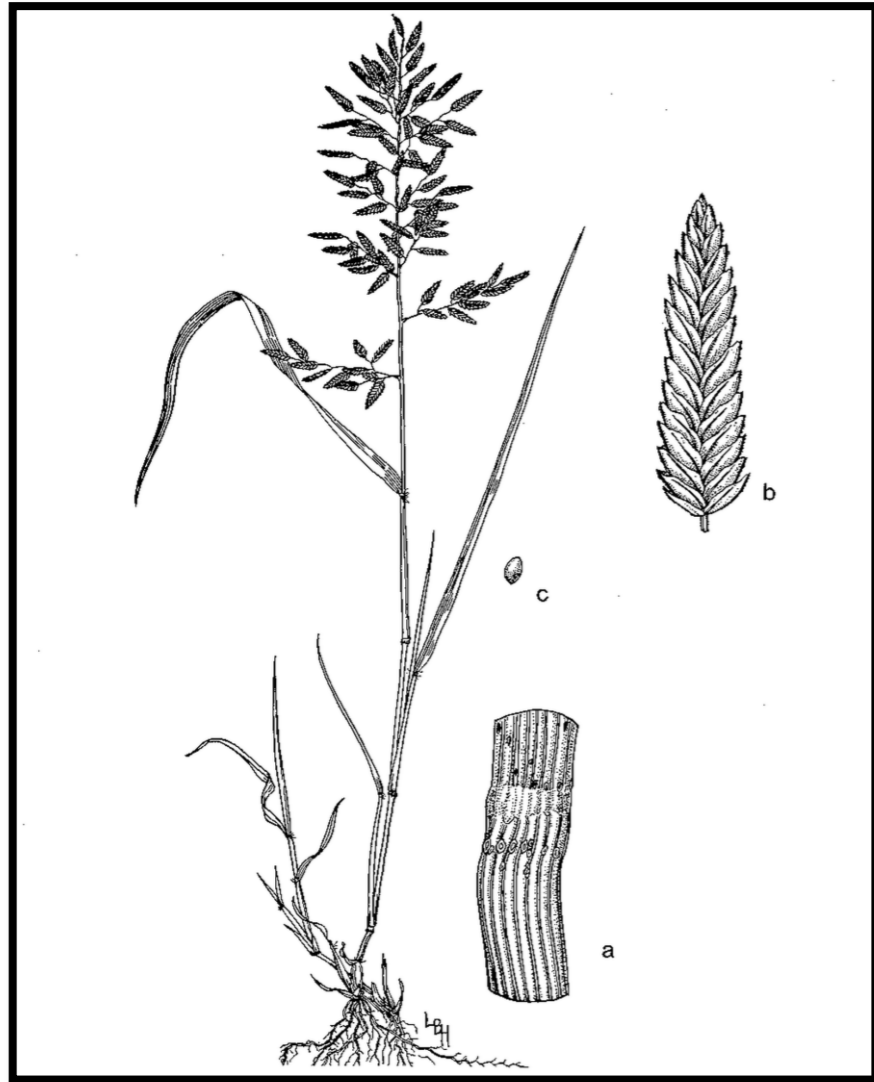
**Fig. 9.28.25** Junglerice (*Echinochloa colona*)—POACEAE. Annual 9-36in tall reproducing from seeds and spreading stems. **Leaves:** Narrow, 2-10mm wide, 8-22cm long with *no ligules*. First leaves often form a dense rosette. Most leaves have distinct purple bands. **Flowers:** In panicles 2-12cm long with 2-10 branches, spikelets hairy, 2-3mm wide, and often purple. **A.** grain (Fig. 9.28.25 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### Junglerice (*Echinochloa colona*) [A|E]

No one knows for sure where this plant originated, but the best guess is it evolved and spread from Old World tropics. It invades disturbed moist sites worldwide. The purple bands on the leaves are unusual. Their ecological purpose eludes me, but they do simplify identification. An invader of rice fields, Junglerice is itself cultivated for food in India and Egypt (Fig. 9.28.26.



**Fig. 9.28.26** Junglerice (Correll and Correll 1972, Public Domain). The artist did not illustrate the purple bands on the leaves. Perhaps they faded as collected plants dry. **A.** hairy leaf blade connection to stalk; **b.** fruit; **c.** seed; **d.** grain; **e.** roots



**Fig. 9.28.27** Stinkgrass (*Eragrostis cilianensis*)--POACEAE. Eurasian annual, branches from the base, culm 4-24in long, prostrate then ascending. **Stems and leaves:** There is often a row of glandular pits below the joints and others scattered on leaves and flower stalks. The pits may produce an odor that repels livestock, but many people can't detect the odor. Ligule a fringe of short hairs (ciliate) less than 1mm long. **Flowers:** Spreading 2-10in long with 12-40 crowded on spikelets 6-20mm long, pointed at both ends. **Seed:** Brown oval grains 1-2mm long pointed at both ends. **a.** Stem with ring of (stink?) glands below the joint. **b.** Spikelet. **c** Grain (Fig. 9.28.27 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### Stinkgrass (*Eragrostis cilianensis*) [A|I]

The malodorous defense. Odor produced by glandular pits on this European weed reminds some people of cockroaches. The similarity isn't clear to me. Stinkgrass has not been abundant in D-H, but it made a major expansion after 2018. If the local gopher/mouse crowd will eat it, it gets to stay (Fig. 9.28.28).



**Fig. 9.28.28** Stinkgrass (photo © GR)



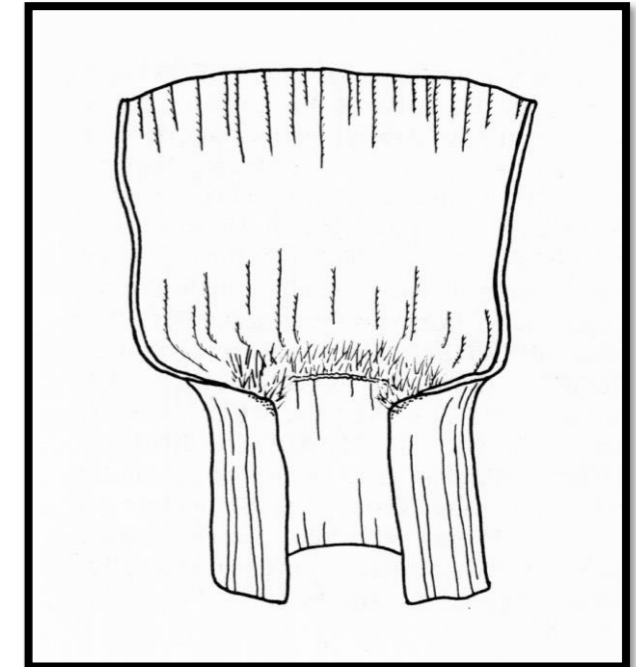
**Fig. 9.28.29** Lehmann's Lovegrass (*Eragrostis lehmanniana*)—POACEAE. Perennial to 1m tall. **Leaves:** Ligules .3-.5mm ciliate, blades 2-12cm long, 1-4mm wide. **Flowers:** Open panicles 7-18cm long and 2-8cm wide with branches 1-8cm long and spikelets 5-14mm long and about 1mm wide with 4-14 florets. **Seeds:** Caryopses about 1mm long, hairless, light brown, seed dark brown (Fig. 9.28.29 photo © Max Licher)

### Lehmann's Lovegrass (*Eragrostis lehmanniana*) [P|I]

Most weeds disperse in wind, water, and animal fur. However, people transport and plant some of them to improve on the services provided by native plants. Range managers introduced two Lovegrasses (Lehmann and Weeping) from South Africa to stabilize soils in overgrazed rangelands. Land managers also planted the grasses to stabilize soil in roadcuts, transmission corridors, and elsewhere. During the 1980's ecologists realized the grasses were invading adjacent native vegetation (Bock et al. 1986). Within a few years, public agencies stopped planting Lovegrasses, but the plants were already out of control. They cover over 20,000 acres of Arizona's arid grassland and they are still spreading.

Lehmann's Lovegrass is unlikely to invade the Desert Grassland or Interior Chaparral near D-H. It appears to need more precipitation than we receive. One patch in the edge of an irrigated pasture at Coldwater Farm spread to about 500ft square by the time I stopped irrigating the pastures in 2009. Without irrigation and with competition from Kochia, the plants faded away until now, eight years after I turned off the water, there are only a few tufts left under the Cottonwood Trees where Kochia doesn't grow (Fig. 9.28.30).

**Fig. 9.28.30** Lehmann's Lovegrass sheath, ligule, blade (drawing by Copple and Pase 1967. U. S. Forest Service)





**Fig. 9.28.31** Weeping Lovegrass (*Eragrostis curvula* var. *conferta*)--POACEAE. Upright perennial, 45-190cm tall; tufts form mounds. Spreads by sprouting from roots that penetrate over 4m deep and spread more than 3m wide. **Leaves:** Sheath with scattered hairs, ligules ciliate, membrane about 1mm long. *Blades 12-60 cm long* and 1-3mm wide, scattered hairs to 7mm long. **Inflorescence:** Panicle 16-40cm long and 4-24cm wide with 4-10mm long spikelets supporting 3-10 florets. Glumes lanceolate 1-3mm long. Three brown anthers. **Caryopses:** 1-2mm long, smooth, light brown, base often green. The plants are taller and the panicle is denser than other *Eragrostis* species (Fig. 9.28.31 photo © Harry Rose)

### Weeping Lovegrass (*Eragrostis curvula* var. *conferta*) [P|I]

Weeping Lovegrass is taller and has larger leaves than Lehmann's Lovegrass. Otherwise, the two are similar in form and behavior (Fig. 9.28.32).



**Fig. 9.28.32** Weeping Lovegrass (photo © Harry Rose)





**Fig. 9.28.33** Wild Barley (*Hordeum murinum* subsp. *leporinum*)--POACEAE. Annual, reproduces by seed, prostrate, with branches 6-20in long. **Leaves:** Flat, 4-10cm long. Ligules short, membranous. **Flowers:** Erect spike 2-3in long, upper portion enclosed in leaf sheath. **Fruit:** Stiff bristles 2-4cm long; seed about 6mm long and hairy on top. **a.** Spikelets. **b.** Floret with long bristle (Fig. 9.28.33 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

**Foxtail Barley (*Hordeum jubatum*).** Similar to Wild Barley, but perennial reproducing by seed and by sprouting from rhizomes. Flowering spikes larger and nodding. The seeds penetrate animal skin and ears, often found inside dog feet having entered through the skin between toes

Weeds of Dewey-Humboldt, Arizona

### Wild Barley (*Hordeum murinum* subsp. *leporinum*) [A-P|PT]

Around D-H, Wild Barley and Foxtail Barley grow along the Agua Fria River, and on the margins of lawns and gardens. People plant Foxtail Barley for the beauty of its seed heads, but that is not a good idea if you have pets. The bristled seeds will burrow into fur and they will inch into nostrils, ears, and some will pierce the skin. When they break the skin, bacterial infections may develop (Fig. 9.28.34).

Both weeds are difficult to control. Wild Barley is difficult because of its heavy seed production and rapid spread. Foxtail Barley is difficult because of its tough spreading roots. In both cases, repeated mowing will do the trick though at first it may seem hopeless. Keep going and you will prevail.

**Fig. 9.28.34** Wild Barley  
(photo © Rasbak)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.28.35** Witchgrass (*Panicum capillare*)--POACEAE. Hairy annual reproducing only by seed, 4-36in high. **Leaves:** Spreading, 3-18mm wide, 5-40cm long, covered by long hairs; ligule ciliate with cilia .5-1.5mm long. **Flowers:** Panicle, 13-50cm long, branching with one 2-3mm long spikelet at tips of branches; panicle often breaks free and blows like a tumbleweed. **Seeds:** Shiny yellow or gray about 2mm long. **a.** Spikelet. **b.** Seeds (Fig. 9.28.35 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

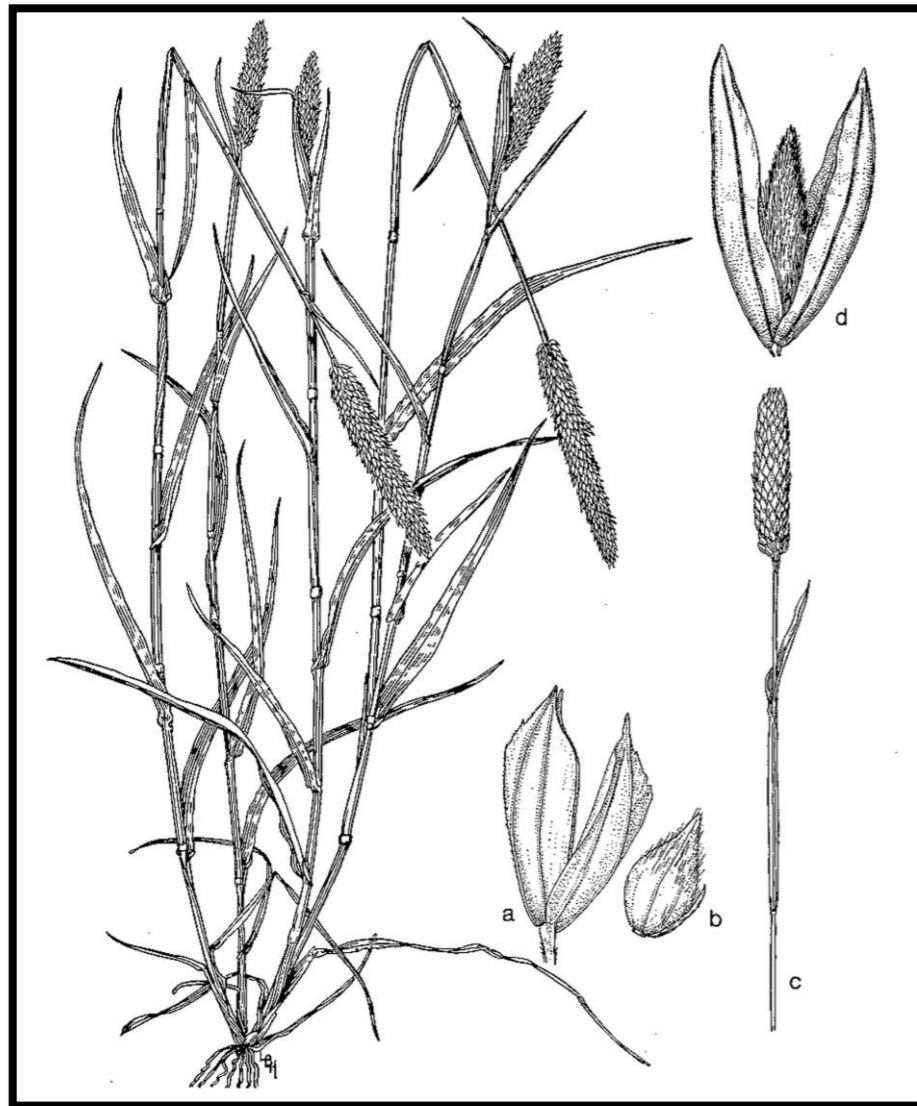
### Witchgrass (*Panicum capillare*) [A|N]

Witchgrass' thin spikes create a misty appearance from a distance. It grows in all the likely places along roads, ditches, and the margins of fields and gardens. One of the most graceful grasses, gardeners often plant Witchgrass in borders and beds. However, the panicles break free and tumble along spreading seeds. If unwelcome seedlings invade your garden, mulching, hoeing, and pulling will bring them under control.

The small seeds appeal to little songbirds, mice, and voles. The leaves appeal to everyone (Fig. 9.28.36).

**Fig. 9.28.36** Witchgrass ripening panicle (photo © Jim Pisarowicz, U. S. National Park Service)





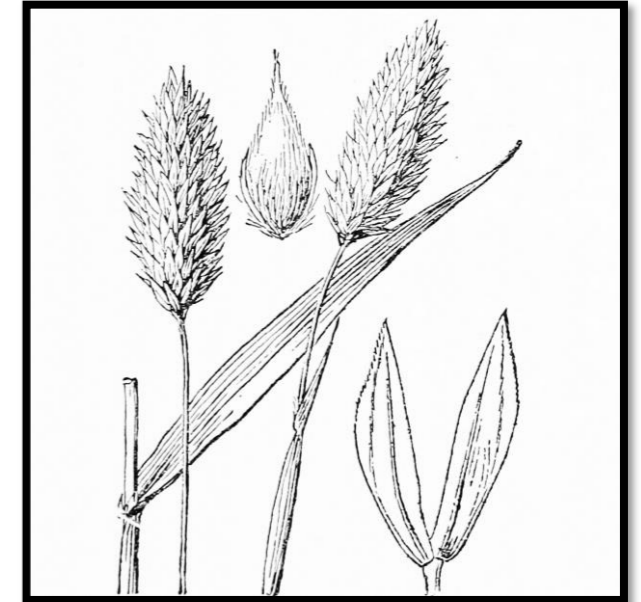
**Fig. 9.28.37** Carolina Canarygrass (*Phalaris caroliniana*)—POACEAE. Bluish green annual to 4ft reproducing only by seed. **Leaves:** Flat or folded 2-15mm wide. Ligules 1-7mm flat to somewhat pointed with shredded edge. **Flowers:** One oblong panicle 1-8cm long topping each stem. Thicker and stubbier than similar Littleseed Canarygrass. Spikelets crowded and overlapping. Two broad outer bracts (glumes) 3-6mm long, sharp, flattened, and folded with upper part of fold forming a papery wing with dark green stripes on each side of the base. **Seed:** **a.** Spikelet with two glumes and seed **b.** shiny brown, hairy, 3-5mm long. **c.** Flowering stem (Fig. 9.28.37 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

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### Carolina Canarygrass (*Phalaris caroliniana*) [A|N]

This annual native grass grows on wet streambanks and other moist disturbed areas. It might show up in a lawn, but mowing will blend it with other grasses and eventually eliminate it (Fig. 9.28.38).

**Fig. 9.28.38** Carolina Canarygrass, glumes, and floret (drawing in Hitchcock and Chase, 1950, USDA)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.28.39** Annual Bluegrass (*Poa annua*)—POACEAE. This grass is never more than 1ft tall. **Leaves:** Soft green leaves have the closed boat-shaped tips of other Poas (bluegrasses). Leaf sheaths enclose the stems for about one-third their length; ligules 1-3mm long, hairless, obtuse to flat. **Flower:** The inflorescence is a panicle 2-8cm long with 2-6 florets on short spikelets. **a.** Spikelet. **b.** Grain (Fig. 9.28.39 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### Annual bluegrass (*Poa annua*) [A|I]

Annual Bluegrass has traveled with people from its Eurasian home to every continent. In America, Sereno Watson found it in the Great Basin Desert of Utah and Nevada during the exploration of the fortieth parallel. He “collected [it] on stream-banks [sic] in cañons near roads traveled only by teams of woodmen” (Watson 1871).

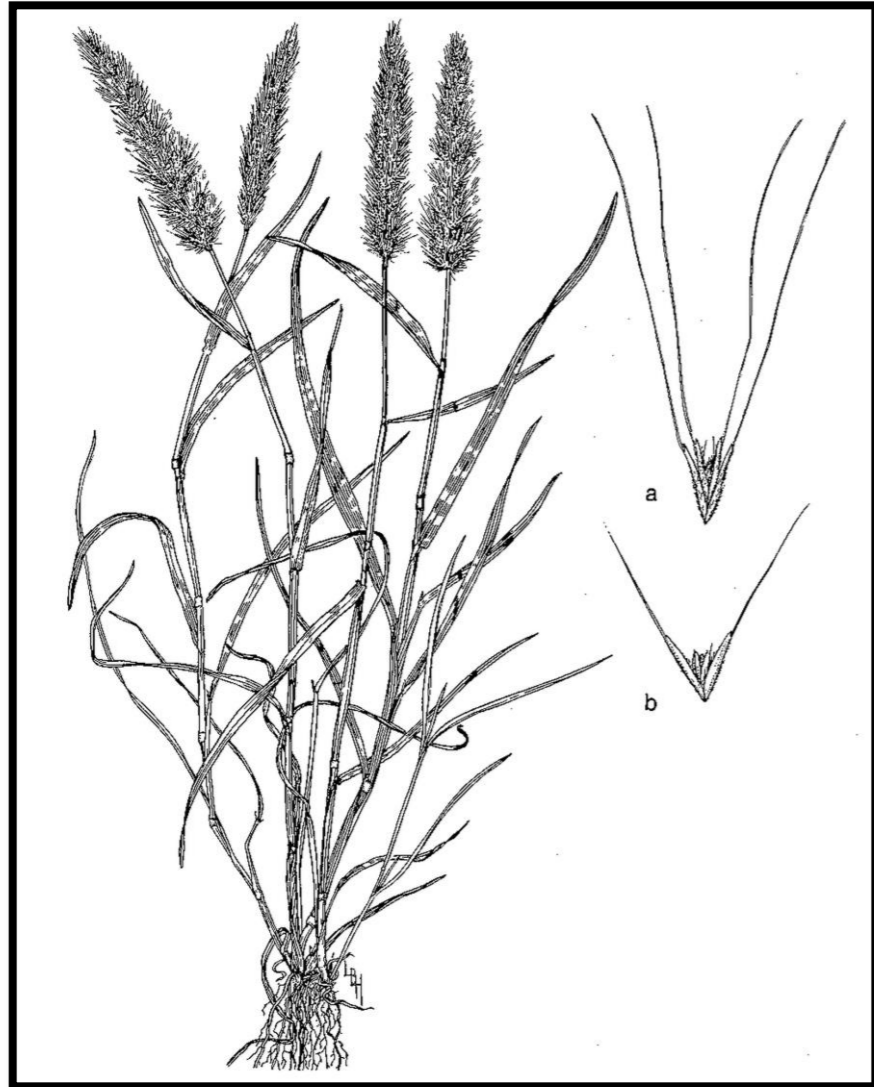
Exceptional summer monsoon and winter rains kept the ground muddy for months during my first year at Coldwater Farm. Shoes had to remain outside the door at home and work. Unfamiliar weeds, some with irritating or painful seeds, filled the fields and bare areas around the house and barn. One weed, Annual Bluegrass, covered patches along the driveway. Soft and green that winter and spring, the grass formed a dry mat during the summer, providing a yearlong mud-free walkway.

What a great plant. I identified it using Parker’s book and headed for town. I asked about seeds at the local building-supply where lawn-grass seeds sold. After a reflective moment, the store employee fulfilled his customer-service obligation without detectable sarcasm and stated, “It’s a weed.” No seed was available.

I found no Annual Bluegrass seed. After twenty years tending this place, I’ve covered the mud with gravel and perennial plants, but patches of the little grass are still present beside the driveway and always trying to creep into the lawn. I could till and reseed it away, but sparrows and butterflies like it, so I’ll let it be (Fig. 9.28.40).

**Fig. 9.28.40** Annual Bluegrass (photo © James Lindsey)





**Fig. 9.28.41** Rabbitfootgrass (*Polypogon monspeliensis*)—POACEAE. Yellow-green annual 4-24in tall with stems often bent and spreading at lower joints, reproduces only from seed. **Leaves:** Blades 2-10mm wide, sheaths open or loose, smooth, hairless. Ligule acute, unfringed. **Flowers:** Spike of many tiny spikelets about 2mm long. Two outer bracts in each spikelet end in a bristle 6-10mm long. Lemma and palea thin, translucent. **Seed:** Plump, amber, caryopsis 1-2mm long. **a.** Spikelet. **b.** Spikelet of Ditch Polypogon (*P. interruptus*)

Ditch Polypogon (*Polypogon interruptus*). -Very similar to rabbitfootgrass, but spikes spread more. Bristles are shorter, about 3mm long. (Fig. 9.28.41 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press).

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### Rabbitfootgrass (*Polypogon monspeliensis*) [A|I]

The origin of this furry moisture-loving grass isn't clear. It might have originated in Europe, but it became a global cosmopolitan so early in human history; it is hard to retrace its path. I first discovered it growing from a cracked rock in the Agua Fria River. Traveling thousands of miles over oceans and mountains to get to this tiny stream running through a desert valley is the nature of weeds, but marvelous nevertheless (Fig. 9.28.42).



**Fig. 9.28.42** Rabbitsfootgrass on a fractured rock in the Agua Fria River (photo © GR)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



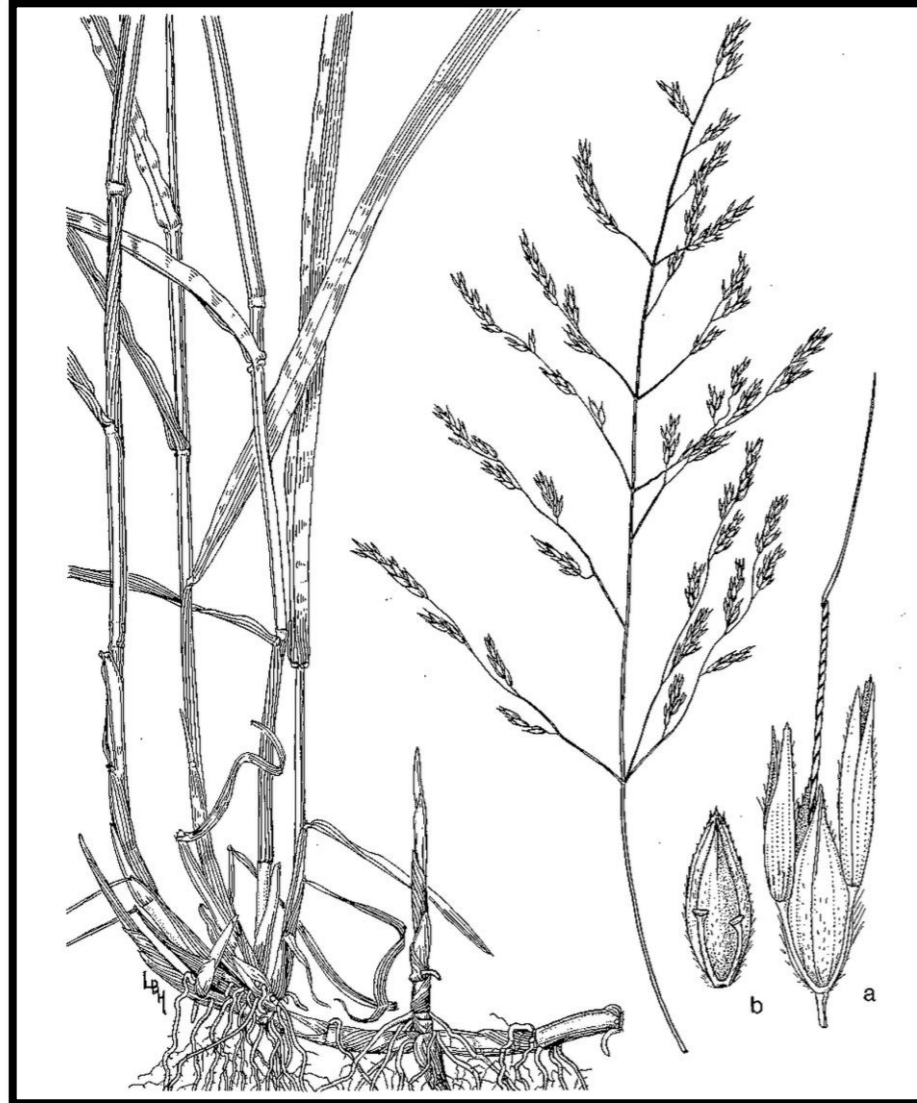
**Fig. 9.28.43** Japanese Bristlegrass (*Setaria faberi*)—POACEAE. Annual 50-200cm tall. **Leaves:** Flat, alternate 15-30cm long, 1-2cm wide. Membranous ciliate ligules 2mm long. **Flowers:** Bristly arching spike 6-20cm long, crowded by spikelets 2-3mm long. *Five to twenty bristles arise from the base of each spikelet.* **Seeds:** Oval, dark green to brown about 2mm long, flattened on one side (Fig. 9.28.43 photo by Mohlenbrock 1989, USDA)

### Japanese Bristlegrass (*Setaria faberi*) [A|EI]

The bristles surrounding the seeds aren't hard and sharp, making the grass more attractive than threatening. The real problem is the plant's ability to invade natural vegetation. Which brings us to the questions: *What and where is natural vegetation?* The short answer is *natural vegetation is wherever native plants dominate and persist.* Something to consider, however, is that a thousand-pound cow has stepped on almost every square foot of the land. In most locations, the cows have weakened native plants and broken biological soil crusts as thoroughly as if someone plowed and replanted the land. The ungrazed places I've seen have few invasive weeds like Japanese Bristlegrass. However, as long as we continue eating beef and wearing belts and boots of cow skin, the ungrazed places will shrink (Fig. 9.28.44).



**Fig. 9.28.44** Japanese Bristlegrass (photo © GR). The arching spikes dry and drop seeds through winter months



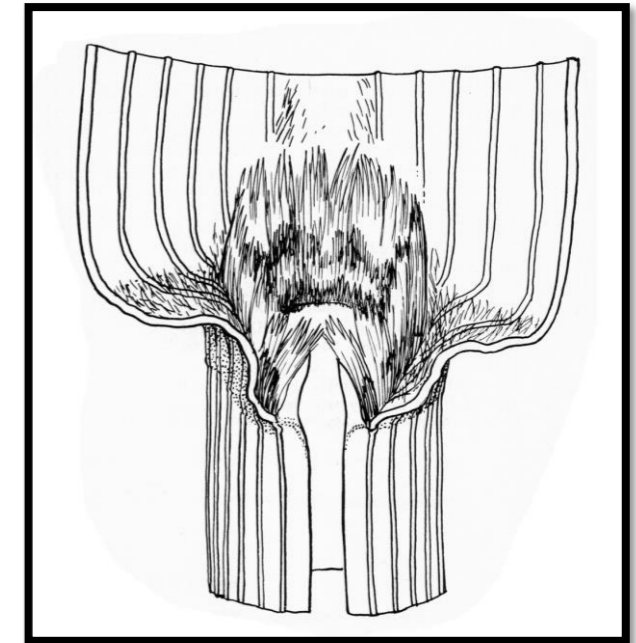
**Fig. 9.28.45** Johnsongrass (*Sorghum halepense*)—POACEAE. Perennial 3-10ft tall spreads by seed and underground rhizomes. **Leaves:** Bright green to 2ft long, 6-20mm wide. Ligule ciliate, 2-6mm long. **Flowers:** In open branching tops 6-24in long. Spikelets in pairs, in threes at tips of branches. One or two stalked flowers bear stamens the other one is about 6mm long, stalkless, thicker, fertile. **Seeds:** Dark brown to black grains 3mm long, shiny. **a.** Three spikelets, two sterile and stalked, the third fertile and awned, at the tip of the stem. **b.** Grain with hull (Fig. 9.28.45 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

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### Johnsongrass (*Sorghum halepense*) [P|I]

Johnsongrass a perennial introduction of Mediterranean origin. There are several small patches near the river and around town in places that receive overspray from lawn sprinklers. Annual mowing and Javelina rooting for rhizomes easily control them. I first saw the plant by the river in 2005 (Fig. 9.28.46).

**Fig. 9.28.46** Johnsongrass sheath, collar, ligule, blade (drawing by Copple and Pase 1967. U. S. Forest Service)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.28.47** Giant Reed (*Arundo donax*)—POACEAE. Plants 2-5m tall (sometimes taller) in clumps. Hollow stems 2-3cm in diameter. **Leaves:** Evenly spaced, alternate, 30-60cm long, 2-7cm wide, with rough edges and wedge-shaped brown mark at base. Ligules an unfringed membrane <1mm. **Flowers:** Feathery plumes 30-60cm long and up to 30cm wide. Spikelets 10-15mm long with 3-6 flowers seedless or with infertile seeds. Reproduces from underground rhizomes (Fig. 9.28.47 drawing from Hitchcock and Chase 1950, USDA)

### Giant Reed (*Arundo donax*) [P|I]

Giant Reed has not colonized the farm yet, but the plant is present elsewhere in the area. It is invasive in moist locations but can be controlled in our arid climate by withholding water. However, it might become a problem along the River. According to contributors to the IUCN Global Invasive Species Database, this is one of the 100 world's worst weeds. Worth watching for.

Grazing animals can eat young plants, and some wildlife species like to rest and nest in the clumps formed by this big leafy grass. The leaves and stems hold high silica content making them quite durable. People have used them for thousands of years for building material, fishing poles, walking sticks, panpipes, and flutes and it is the principal source of reeds for wind instruments (Fig. 9.28.48).



**Fig. 9.28.48** Giant Reed (photo © Forest and Kim Star)





**Fig. 9.28.49** Crested Wheatgrass (*Agropyron cristatum*)—POACEAE. To 110cm tall, often under 40cm, spikes 10cm with two rows of overlapping spikelets. **Leaves:** 5-20cm long, 2-6mm wide; ligules membranous, less than 2mm. **Flowers:** Spikes to 10cm long with 2 rows of overlapping 7-16mm long spikelets each with 3-6 florets; anthers 3-5mm. **Fruit:** Elliptical grooved caryopsis. **Insets** left to right: Flower, fruit, stigma, grain (Fig. 9.28.49 painting by Schmidt 1801)

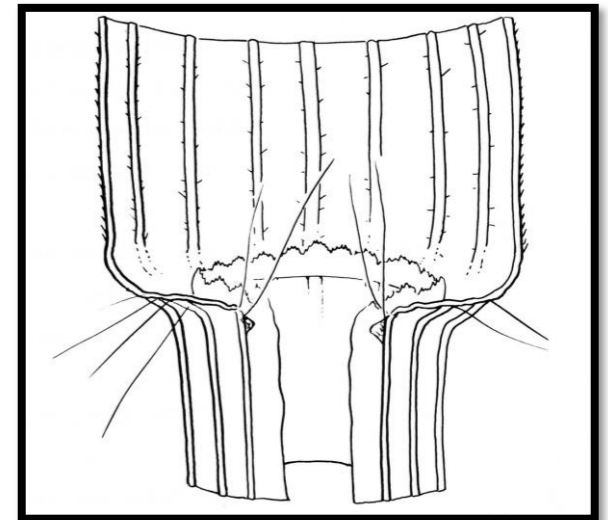
Weeds of Dewey-Humboldt, Arizona

### Crested Wheatgrass (*Agropyron cristatum*) [P|I]

U. S. range managers imported this Siberian steppe grass to plant on overgrazed ranges stripped bare by cattle, fire, or construction. Crested Wheatgrass grows well on bare ground, protects the soil, and satisfies the need for a nutritious feed for livestock (Figs. 9.28.50-51).

Range managers soon discovered the grass blocked the return of native plants and created a low diversity landscape of reduced value for wildlife. Now the plant is the dominant on over 10 million acres in the northern Great Plains and Canada. It surprised me to find it growing this far south. Control will not be a problem in our warm dry landscape.

**Fig. 9.28.50** Crested Wheatgrass sheath, ligule, blade (drawing in Copple and Pase. 1967. U. S. Forest Service)



**Fig. 9.28.51** Crested Wheatgrass (© Max Lavin)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.28.52** Jointed Goatgrass (*Aegilops cylindrica*)—POACEAE. Annual to 1m tall. **Leaves:** Open sheaths; ligule short, blades flat, slightly hairy, 3-14cm long and 2-5mm wide. **Flowers:** Spikes 2-12cm long, 3mm wide, cylindrical, with 3-8 fertile spikelets 9-12 mm long. **Seeds:** Glumes of lower spikelets with 2-5mm long awns, apical spikelet glumes with 3-6cm awn. Lemmas of apical spikelets have one 4-8cm long awn (Fig. 9.28.52 painting: artist unknown, Public Domain)

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### Jointed Goatgrass (*Aegilops cylindrica*) [AZ2]

An introduced Eurasian annual, Jointed Goatgrass' tight cylindrical seed head is distinctive. The plant is present in disturbed sites, especially along roads. In the Midwestern U. S., it invades winter wheat and other crops. It has spread in some of the remnant grasslands of the Great Plains, but it hasn't invaded native desert grassland and shrublands in the western U. S.

Seeded joints of the grass often mix with wheat stems and the seeds blend with wheat seeds transported to new fields. Eradication efforts use crop rotations, and seasonal applications of specialized herbicides, species-specific harmful microbacteria, and burning, but nothing has been completely effective.

Though Jointed Goatgrass' production of food is about half that of winter wheat, the plant might become important for its greater resistance to drought (Fig. 9.28.53).

**Fig. 9.28.53** Jointed Goatgrass (photo © Stefan.lefnaer)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.28.54** Quackgrass (*Elytrigia repens*)—POACEAE. Reproduces from seeds and rhizomes. Grows 1-5ft tall. **Leaves:** 6-30cm long, 3-10mm wide; ligules 0.3-1.5mm. **Flowers:** Spikes 5-15cm long and 5-15mm wide with 10-27mm spikelet per node. Spikelets fall intact (Fig. 9.28.54 painting: Norman Criddle in Clark and Fletcher, 1909)

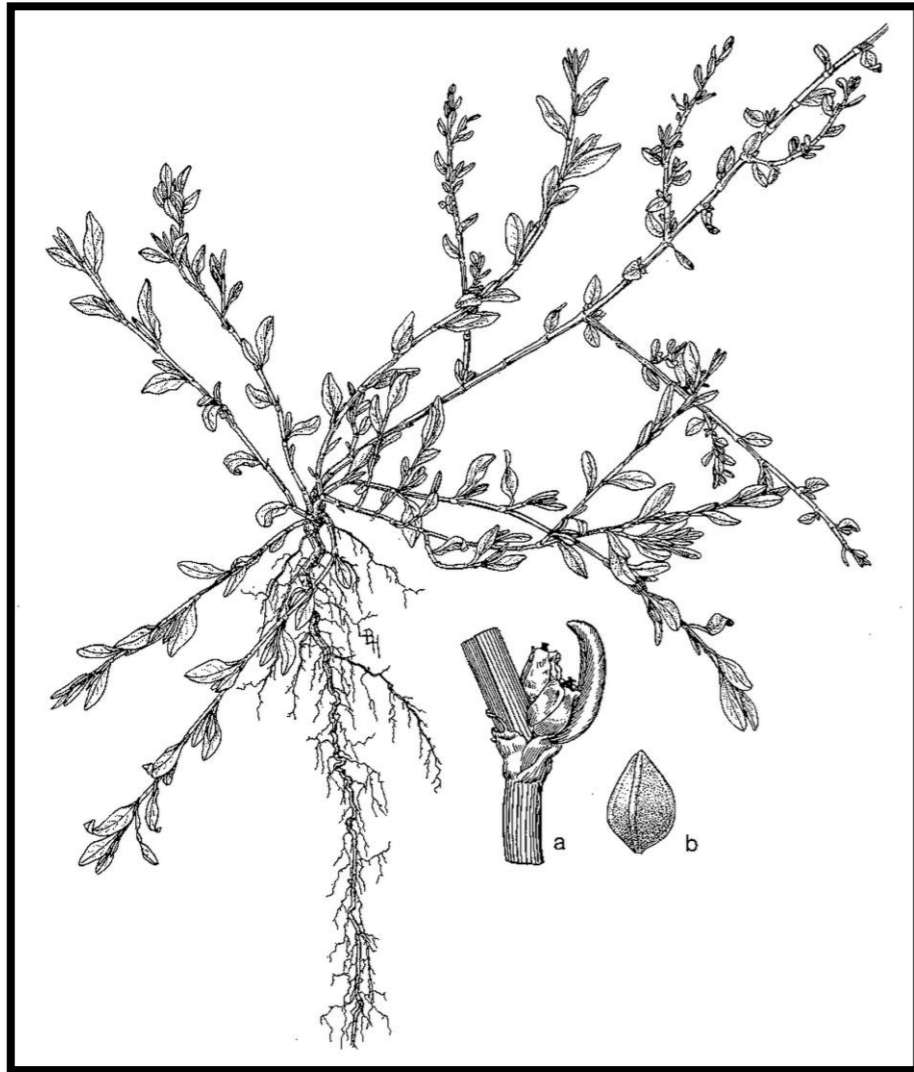
### Quackgrass (*Elytrigia repens*) [P|IMTZ-2]

A Eurasian perennial scattered here and there around the farm, Quackgrass creeping rhizomes spread into lawns and into native vegetation. As with most grasses, the entire plant serves as food for wildlife species. Nevertheless, this alien grass is too destructive to ignore. Eradication is difficult, because the rhizomes weave among the roots of other plants and even a small fragment can develop into a new plant. Wikipedia has an extensive discussion of removal strategies. As with many other weeds, early detection is critical to control (Fig. 9.28.55).



**Fig. 9.28.55** blunt ligule 1mm high (photo © Rasbak)

## 9.29 KNOTWEED FAMILY—POLYGONACEAE



**Fig. 9.29.1** Prostrate Knotweed (*Polygonum aviculare*)—POLYGONACEAE. Green or blue green annual; sometimes whitish from powdery mildew. Reproduces by seeds. Branching stems form mats 4-48in across. **Leaves:** Small, alternate, pointed, 6-38mm long and up to 10mm wide. Present to the ends of the stems. **Flowers:** a. White or green with pink tinge occur in small clusters in leaf axils on upper stems (Fig. 9.29.2). **Fruit:** b. Achenes three-sided dark brown to black, 1-4mm long (Fig. 9.29.1 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

**Prostrate Knotweed (*Polygonum aviculare*) [A|N]**

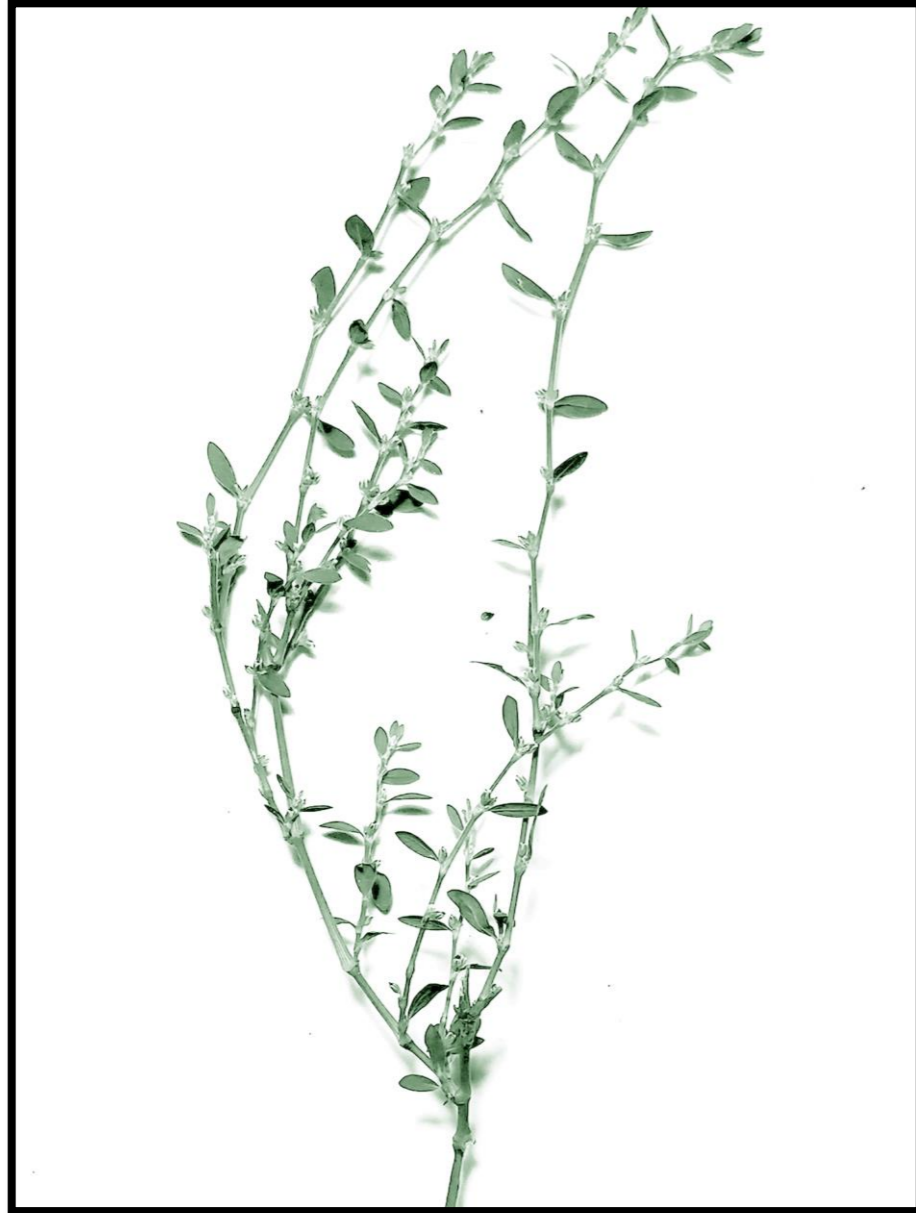
This tangle of thin stems lives beside the stepping-stones on my back walk. It can't spread into the adjacent lawn because of periodic mowing. It doesn't impede traffic, and its tiny flowers and seeds feed a few arthropods and birds. The seeds stay viable for several years, so it should return every year (Fig. 9.29.2).

Some writers claim Prostrate Knotweed is native to both North America and Europe. Did the species spring up on both continents? The ancient Greek philosopher Aristotle might have accepted that possibility, but modern geographers know that species have to come from one place. While it is possible the tiny seeds crossed the ocean before humans came along to help, the SEINet distribution map for the species leads us to a much firmer conclusion. Looking at the SEINet map and applying a little spatial reasoning, I say the plant is a North American native. Look at the map and think about seeds dispersing from a point of origin. What do you think?

**Fig. 9.29.2** Prostrate Knotweed (photo © Stefan Lefnaer)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.29.3** Erect Knotweed (Wireweed) (*Polygonum erectum*)—POLYGONACEAE. A small lithe plant; grows 10-75cm tall. **Leaves:** Green or yellowish, 3-6cm long, 1-3cm wide. Stem sheaths 7-12mm long. **Flowers:** One to five tiny, closed flowers in axils of most leaves. **Seed:** Achenes enclosed in perianth (Fig. 9.29.3 photo © GR)

### Erect Knotweed (Wireweed) (*Polygonum erectum*) [A]

This Old World native is most common in eastern U. S. and Canada. It colonizes disturbed areas but isn't a significant invader of the livestock ranges of the west. It's been here for a long time; Sereno Watson found it in western Nevada in 1870 (Watson 1871).

The Knotweeds are easy to overlook. They are small, spindly, and have sparse foliage. This one grows beside my front walk. Eradication would be a simple matter of pulling the plant. However, it's an annual so I'll leave it unless it spreads into the lawn. It's not in the way, and it feeds butterflies and moths (Fig. 9.29.4).

**Fig. 9.29.4** Erect Knotweed. Tiny flowers are present in the leaf axils (photo © GR)





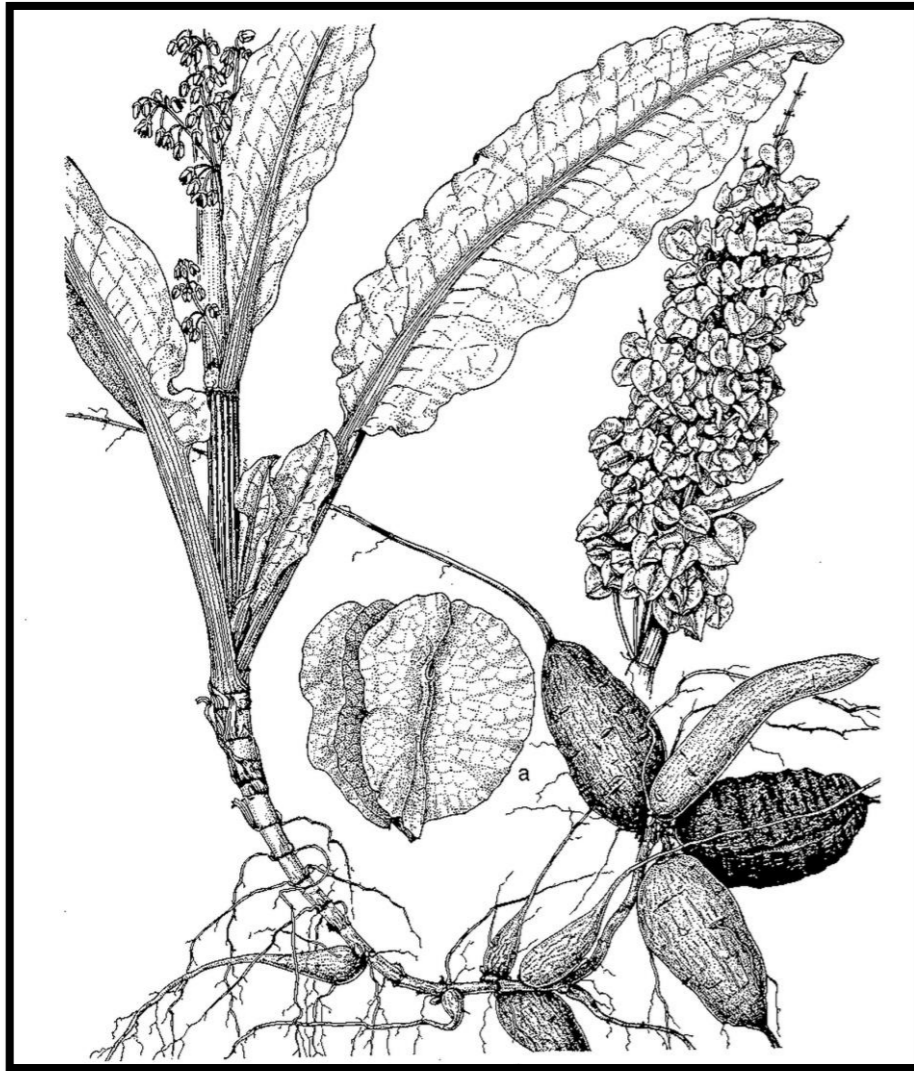
**Fig. 9.29.5** Red Sorrel (*Rumex acetosella*)--POLYGONACEAE. Perennial 6-36in tall reproduces from seed and rhizomes. **Leaves:** Alternate, arrowshaped 1-3in long with basal lobes, more numerous near base of plant. **Flowers:** Male flowers yellow, female reddish, on separate plants. **Seeds:** Achenes dark brown, 1-2mm long. **a.** Male plant with staminate flowers. **b.** Branch from female plant in fruit. **c.** Achene with enclosed seed (Fig. 9.29.5 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### Red Sorrel (*Rumex acetosella*) [P|EM]

Red Sorrel (Sheep Sour) from the southwestern Mediterranean region grows best in damp acidic soils. In D-H it grows on lawn margins and along the Agua Fria River. In our arid environment, the plant is easy to control. It doesn't spread across the land, and it dies after a few seasons of pulling or mowing. The weed scientist's call to duty, EDRR (early detection, rapid response) is certainly applicable; plants pulled before rhizomes spread may not sprout again (Fig. 9.29.6).



**Fig. 9.29.6** Red Sorrell (photo © AnRo0002)



**Fig. 9.29.7** Canaigre (Wild Rhubarb) (*Rumex hymenosepalus*)—POLYGONACEAE. Stout fleshy stems 1-3ft high, reproduces by seed and from rhizomes. Forms cluster of 2-12 tubers. **Leaves:** Margins smooth and wavy not as rough as Curly Dock (next). The leaves are hairless and have thin sheaths surrounding the base of the stalk. Lower leaves 8-24in long and 2-4in wide with straight edges. **Flowers:** Pale green in a dense leafless cluster 6-12in long. **a.** Fruiting calyx enlarged (Fig. 9.29.7 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

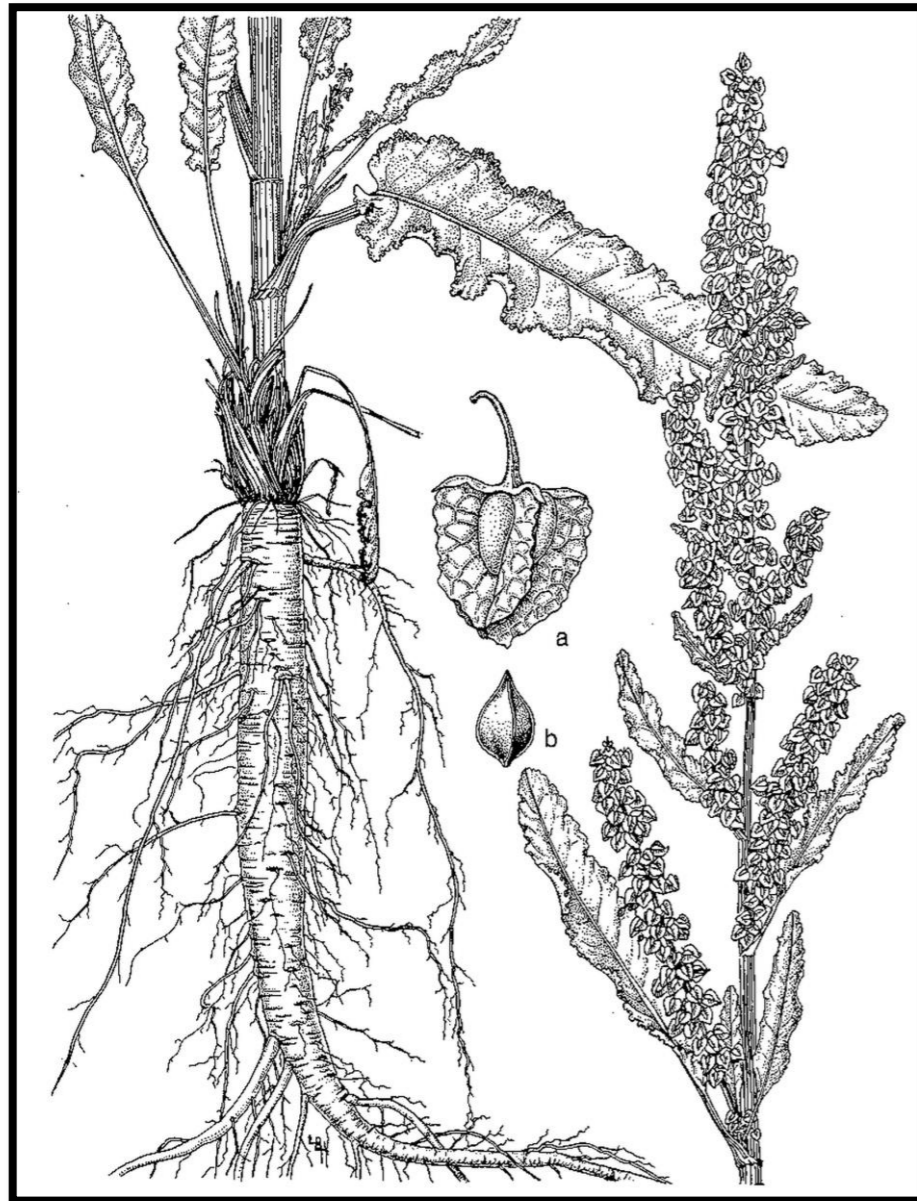
### **Canaigre (Wild Rhubarb) (*Rumex hymenosepalus*) [P|EMN]**

Canaigre is a native weed that grows in moist soils in disturbed sites. It grows beside roads, along the Agua Fria River, and in irrigated yards, gardens, and fields (Fig. 9.29.8).

Besides protecting soil and feeding wildlife, Canaigre has value for people. The roots hold tannin and produce a medium brown dye. Aboveground plant parts are edible. Young leaves add tang to salads, and cooked older leaf stalks resemble rhubarb. I like the leaves, but not everyone does. "The leaves can be used as a substitute for rhubarb, although frankly it's pretty grim stuff" (Moore 2003).



**Fig. 9.29.8** Canaigre © Stan Shebs



**Fig. 9.29.9** Curly Dock (*Rumex crispus*)—POLYGONACEAE. Eighteen to forty-eight inches tall, the fleshy stems die and regrow each spring. **Leaves:** Blue-green, alternate, 3-12in long with wavy edges. **Flowers:** Small green flowers produce red seeds in a large cluster 6-24in long that brown as they age. The flowers aren't as dense as Canaigre's. **Seeds:** The flower's inner parts become large heartshaped wings 3-6mm long and surrounding the tiny fruit. **a.** Fruiting calyx. **b.** Achene (Fig. 9.29.9 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)  
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### Curly Dock (*Rumex crispus*) [P|M]

Except for its curly leaf margins, this Eurasian and North African perennial resembles its American relative (Canaigre). In D-H, it grows in the same moist habitats, depressions, pond and river edges, and lawn margins (Fig. 9.29.10).

Curly Dock has medicinal value. You can even buy it transformed into small round pills. Use Moore's 2003 book to learn more.

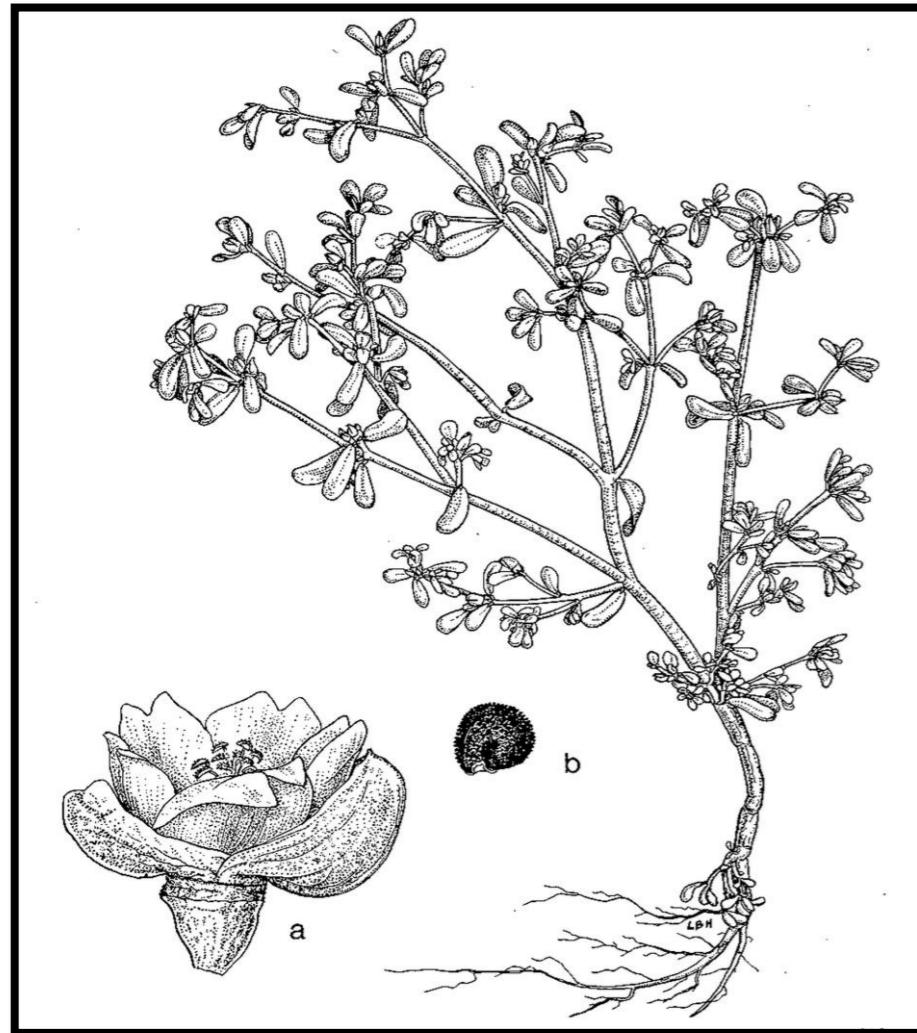
**Fig. 9.29.10** Curly Dock seeds (photo © Stickpen)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



### 9.30 PURSLANE FAMILY—PORTULACACEAE



**9.30.1** Common Purslane (*Portulaca oleracea*)—PORTULACACEAE. Smooth fleshy leaves on reddish prostrate branches 6-24in long. Can form mats with tips turned up. Single plants can be upright to about 12in. **Leaves:** The leaves are alternate not opposite as in similar Horse Purslane (*Trianthema portulacastrum*, AIZOACEAE family) a bitter tasting plant, and Woolly Tidestromia (*Tidestromia lanuginosa*) a hairy plant which I haven't tasted. The leaves are spatulate with rounded tips, and grow singly or in clusters. Horse Purslane leaves are round. **Flowers:** Small stalkless flowers yellow, not purple like Horse Purslane, appear from April to June and are single or clustered in the leaf and branch axils and at stem tips. They open in the morning revealing 7-20 stamens. **Seeds:** The upper half of the globular seedpods falls when seeds are mature. The black flattened seeds are less than 1mm long with a white spot at the scar. **a.** Flower. **b.** Seed (Fig. 9.30.1 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

### Common Purslane (*Portulaca oleracea*) [A|DEZ-1]

This European annual has been with us a long time. As with Common Lambsquarters, Purslane cultivation has gone on for thousands of years.

Purslane occurs throughout the Old World. Its means of reaching the New World is unknown, but evidence shows it was present during pre-Columbian times from 1350 to 1539 (Byrne and McAndrews 1975).

Present in many prehistoric sites, the plant appears in historic records from the seventh century BC. Theophrastus recommended sowing Purslane in April, and Pliny the Elder recommended wearing a Purslane amulet to block evil (Megaloudi Fragiska 2005).

Purslane has more omega-3 fatty acids (alpha-linolenic acid in particular) than any other leafy vegetable. Moreover, one cup of cooked leaves contains 561mg of potassium, 90mg of calcium, and 2,000 units of vitamin A. Wikipedia describes harvesting and preparing plants for lunch (or dinner).

Despite its many benefits, weed scientists consider Purslane to be one of the ten most noxious weeds worldwide (Fig. 9.30.2). Hmm.

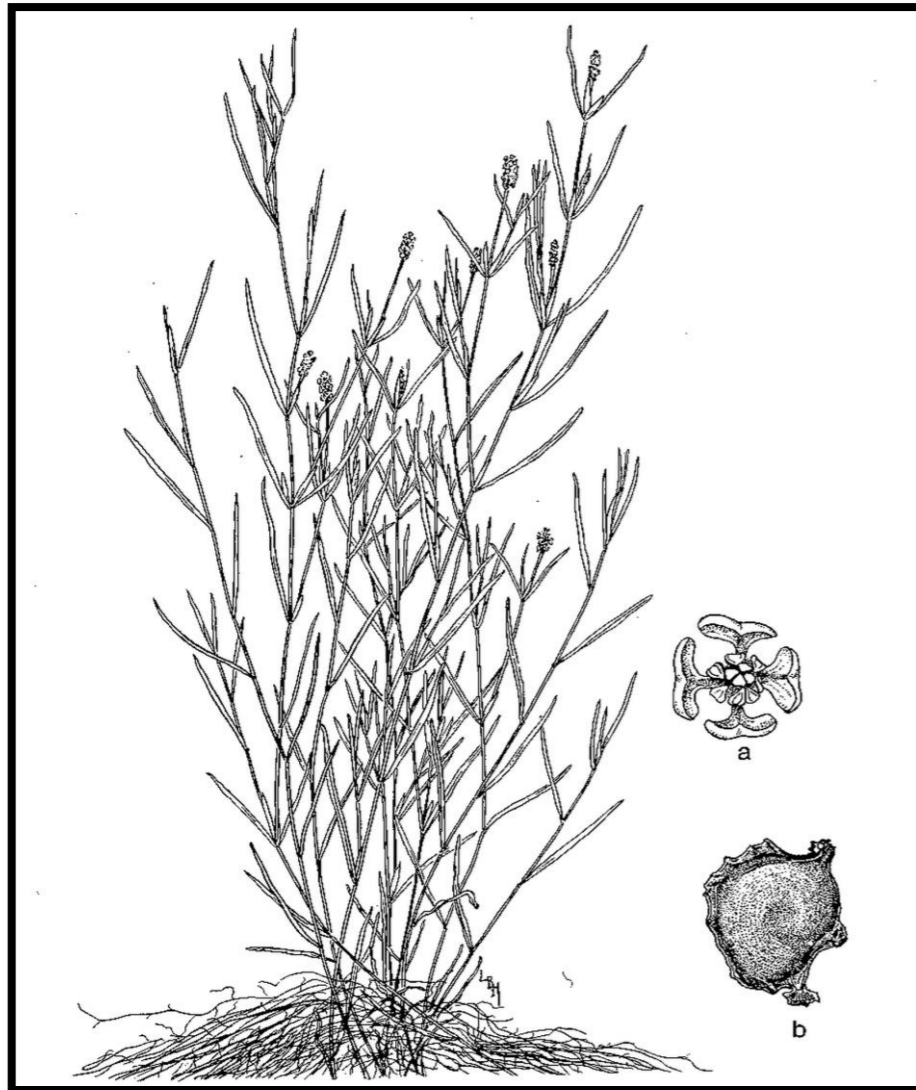
**Fig. 9.30.2** Common Purslane (photo © GR)



A similar plant common in D-H is Horse Purslane (*Trianthema portulacastrum*) a member of the Ice Plant family, AIZOACEAE). Horse Purslane leaves are round rather than oblong. Though sometimes eaten, this plant is quite bitter. It reported to have many medicinal uses (Yamaki et al. 2016).

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]

### 9.31 PONDWEED FAMILY—POTAMOGETONACEAE



**Fig. 9.31.1** Leafy Pondweed (*Potamogeton foliosus*)—POTAMOGETONACEAE. Aquatic perennial reproduces by seed and from rhizomes. Threadlike branching stems as long as 42in. **Leaves:** Alternate, submerged, deep green to bronze, to 3mm wide and 4in long. **Flowers:** Tiny, stalkless with four brown petallike parts 1mm long clusters of 2-12 flowers above water while in flower but submerged by the time fruit matures. **Seeds:** Nutlets 2-3mm long, greenish brown. **a.** Flower with four petallike parts. **b.** Nutlet showing the typical beak and scalloped keel (Fig. 9.31.1 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

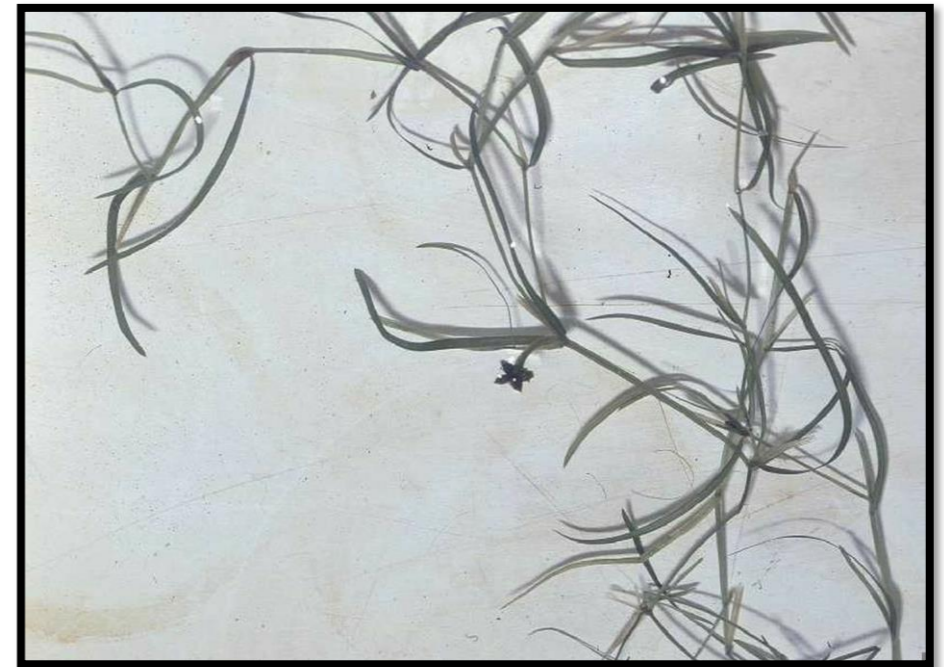
Weeds of Dewey-Humboldt, Arizona

### Leafy Pondweed (*Potamogeton foliosus*) [P|N]

This weed is a valuable source of food and cover for aquatic wildlife. We can lose it when nitrates from farms and human wastes promote heavy growth by floating algae. The algae block light and deplete oxygen. A few years after I moved to the farm, the algae became so dense in one pond it killed off most of the plants and all of the fish.

Fifteen years ago, I added Grass Carp, Koi, and Goldfish fingerlings to the ponds at Coldwater Farm to help control the algae. The fish did well. In 10 years, the Koi exceeded 20in in length. They reproduced and together with the Carp and Goldfish, they were doing a fine job controlling the algae. Ten years ago, a Bald Eagle began fishing the ponds. Five years ago, a pair of Double-crested Cormorants joined the Eagle. In 2017, I saw two Koi and no Goldfish.

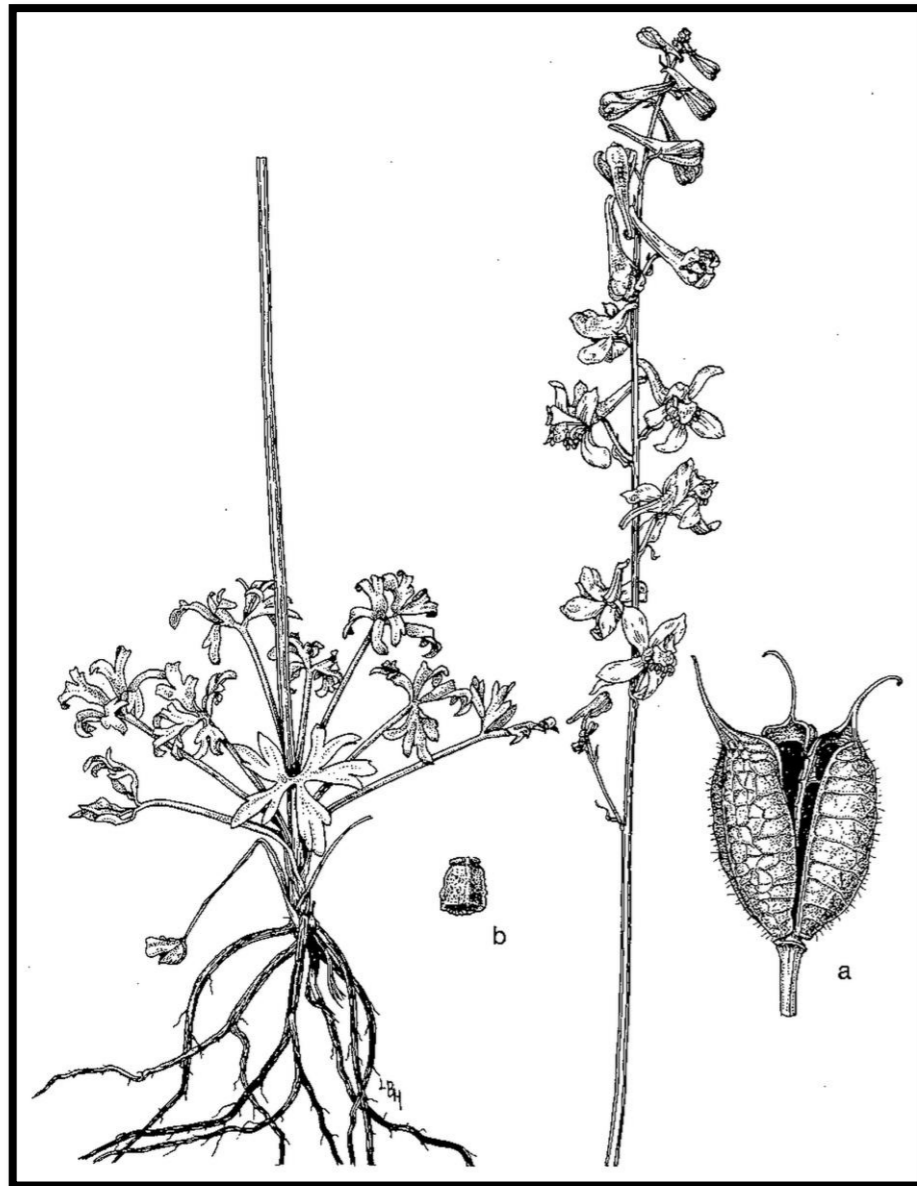
Leafy Pondweed can behave badly in warm climates. It can form mats so dense they block the flow of water in irrigation canals (Fig. 9.31.2).



**Fig. 9.31.2** Leafy Pondweed (photo by Mohlenbrock 1995; USDA)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]

## 9.32 BUTTERCUP FAMILY—RANUNCULACEAE



**Fig. 9.32.1** Barestem Larkspur (*Delphinium scaposum*)—RANUNCULACEAE. This 6-30in tall gray-green perennial reproduces from seed and from clusters of dark woody roots. **Leaves:** Divided into narrow segments. **Flowers:** Vivid royal blue sepals with long basal spurs. **a.** Seed pod (1-2cm long). **b.** Seed (3mm) (Fig. 9.32.1 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

**Barestem Larkspur (*Delphinium scaposum*) [P|DMN]**

This drought-tolerant native plant rises from seeds and perennial roots. New shoots form patches that flower spring through summer. My colonies usually die after two to three years (Fig. 9.32.2).

The plant's foliage poisons cattle, but the flowers are fabulous insect magnets. Butterflies, bees, flies, and moths of many species like the nectar. Around my house, Larkspur is the most popular flower for bumblebees including the big shiny black carpenters.

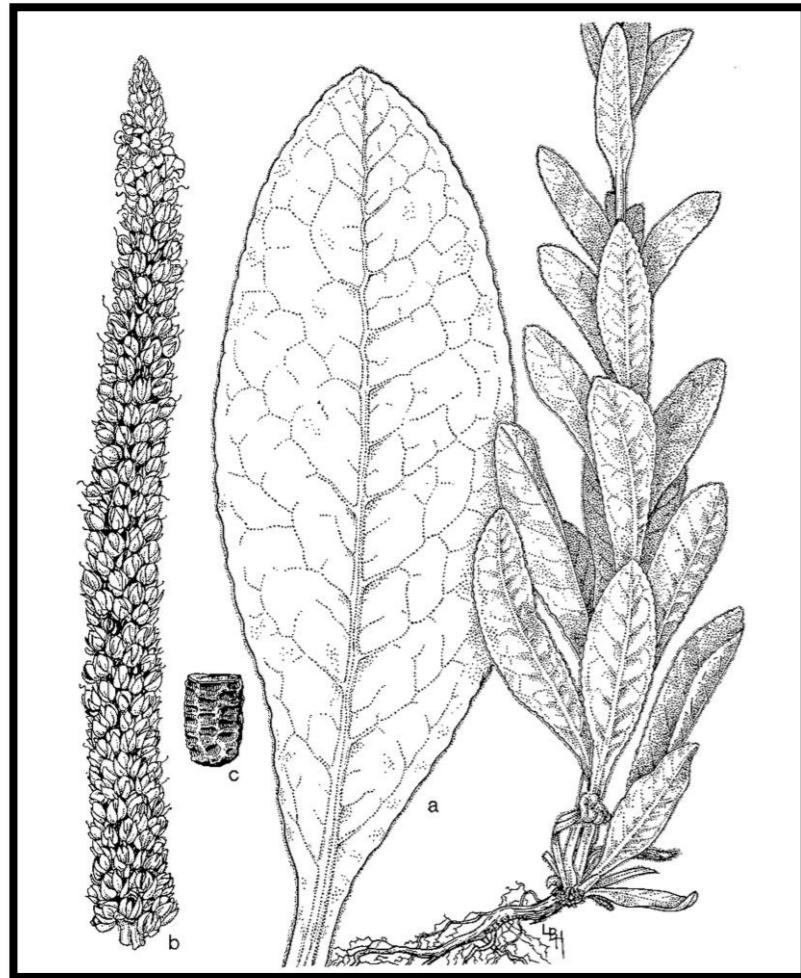
Moore (2003) describes preparation and use of Larkspur seeds to control lice. Good to know.

**Fig. 9.32.2** Royal blue to purple Barestem Larkspur is a common desert weed (photo © GR)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]

### 9.33 SNAPDRAGON FAMILY—SCROPHULARIACEAE



**Fig. 9.33.1** Common Mullein (*Verbascum thapsus*)— SCROPHULARIACEAE. Two to ten feet high, usually less than six. Covered by matted layers of short starlike hairs. **Leaves:** Basal leaves 6-18in long, upper leaves smaller. Leaves stalkless and bases attach to the stem down to the next leaf. **Flowers:** Lemon yellow, stalkless, five-lobed, 20-25mm across, crowded on a 1-3ft spike at the top of the stem. The spikes are 20-32mm thick. **Seeds:** Tomentose eggshaped seedpods about 6mm in diameter contain innumerable dark brown seeds less than 1mm long. **a.** Woolly basal leaf. **b.** Upper portion of fruiting spike with flowers at tip and seedpods below. **c.** Seed, enlarged (Fig. 9.33.1 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### Common Mullein (*Verbascum thapsus*) [B|M]

Big thick wooly leaves and stout flower spikes make Mullein unmistakable. This European biennial begins life with a basal rosette the first year and the tall stem the second year. Flowers appear from June to August and sometimes later. The plant colonizes disturbed soil along roads, railroads, transmission corridors, and overgrazed ranges (Fig. 9.33.2).

Mullein is a safe remedy for many medical problems, and it has other uses. “Although not comparable in luxury to two-ply, scented bathroom tissue, the leaves are sort of floral designed and may be used similarly—and there is no chance of confusing it with poison oak” (Moore 2003: 173).

**Fig. 9.33.2** Mullein outstanding in its field (© GR)



### 9.34 QUASSIA FAMILY—SIMAROUBACEAE



**Fig. 9.34.1** Tree of Heaven (*Ailanthus altissima*)—SIMAROUBACEAE. Tree to 20m often producing clonal thickets from rhizomes. **Leaves:** Pinnately compound 30-100mm long with 9-31 lanceolate leaflets 5-15cm long with a *single terminal leaflet*. (Arizona Walnut leaves are similar but smaller: 18-38cm long with 9-15 leaflets. They have a small terminal leaflet or none.) **Flowers:** In large terminal panicles 10-40cm long with small green to white flowers with wooly petals 2-3mm long. **Fruit:** Samaras (winged achenes) 3-5cm long, twisted one-half turn at the top (Fig. 9.34.1 photo © GR)

### Tree of Heaven (*Ailanthus altissima*) [P|IMT]

This common tree forms dense patches on roadsides and in yards. It tolerates harsh conditions, which could be good, but it is malodorous and spreads as fast as zombies did in the movie *World War Z* (Carnahan et al. 2013). The tree does grow throughout New York City where I've seen it doing fine in dark slots between apartment buildings. Eradication of established clones requires initial sawing or chopping followed by vigilance to eliminate sprouts before they make leaves and contribute energy to the roots (Fig. 9.34.2).

Traditional Chinese medicine uses Tree of Heaven. Wikipedia gives a detailed example of a cure for mental illness that uses the tree's roots, urine from young boys, and a black-bean concoction. There are other, less exotic sounding medicines described in Wikipedia, but Moore (1989, 2003) doesn't mention Tree of Heaven.

**Fig. 9.34.2** Tree of Heaven leaves and samaras (photo © GR)



## 9.35 POTATO FAMILY—SOLIANACEAE



**Fig. 9.35.1** Sacred Datura (*Datura innoxia*)—SOLIANACEAE. Large gray-green perennial 2-3ft tall forms spreading clumps. **Leaves:** Alternate, eggshapped, 3-10in long with wavy toothed edges and pointed tip. White veins obvious especially below. **Flowers:** Fragrant, large, white or pale lavender, funnelshaped, 6-10in wide with slender teeth 1-2cm long. Arise in forks of stems, open in the evening and close by noon. **Fruit:** Hard round seedpods with 1cm long spines contain yellow-brown seeds. **a.** Spiny seedpod. **b.** Seed (Fig. 9.35.1 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

Sacred Datura (*Datura innoxia*) [P|DMN]

Carlos Castaneda popularized this native weed in a mystical memoir published in 1968. Adventurous youngsters are still getting their stomachs pumped. Datura has several medicinal uses, but “This plant should never be taken internally for any reason” (Moore 2003). Fig. 9.35.2.

**Fig. 9.35.2** Sacred Datura—common across southern North America and scattered in South America (photo © GR)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]



**Fig. 9.35.3** Woodland Tobacco (*Nicotiana sylvestris*)—SOLIANACEA. Annual herb to 66in tall. **Leaves** lightly sticky, partially clasping. Largest leaves at base to 2ft long and 10 wide. **Flowers** in racemes, tubular, to 8cm long with 32mm wide bell. Powerful sweet scent strongest at night. Tiny **seeds** about 1mm, brown (Fig. 9.35.3 photo © GR)

Another species, Desert Tobacco (*Nicotiana obtusifolia*) grows less than 1m tall with leaves to 15cm long and with small flowers to 1cm long. The plant's leaves have glandular sticky hairs that give it a bitter scent

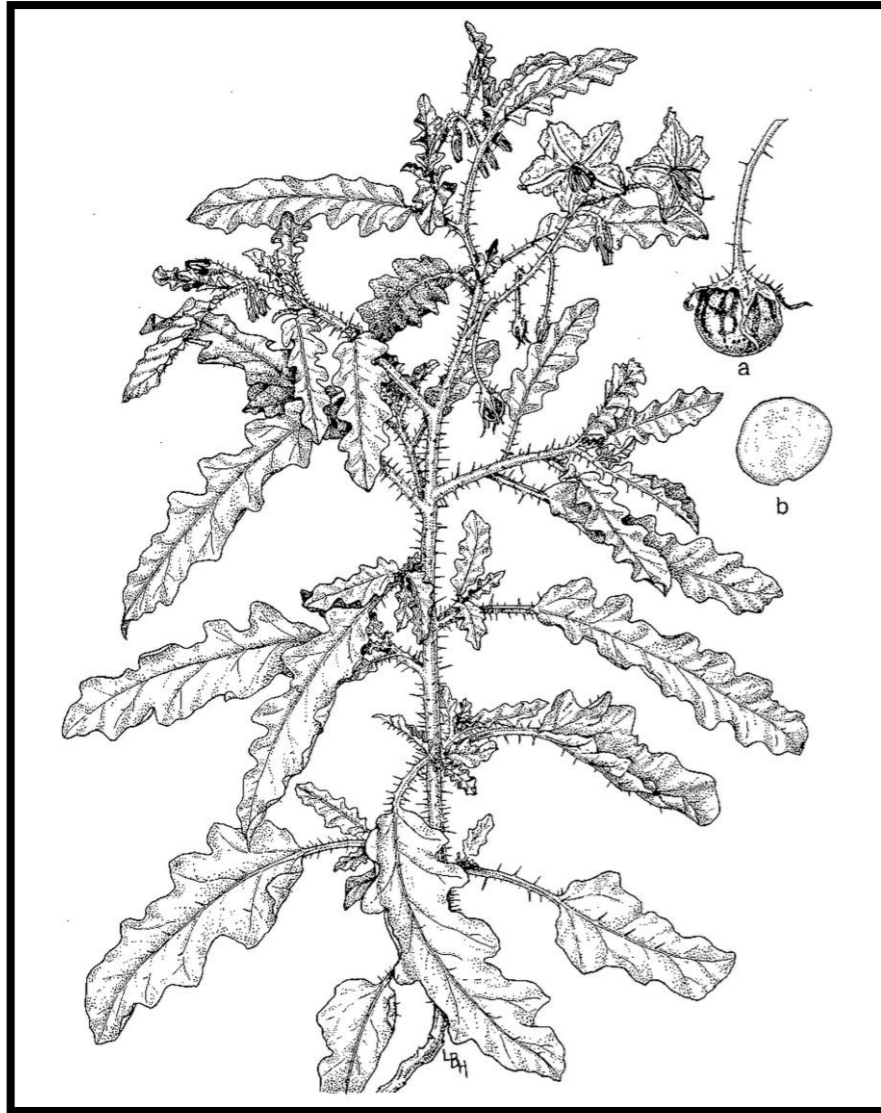
### Woodland Tobacco (*Nicotiana sylvestris*) [A|DEM]

This South American plant has interesting flowers with sweet fragrance that intensifies after dark to attract nocturnal pollinators. The nursery industry disperses Tree Tobacco as an ornamental. Online sources say the plant is perennial, but I see no evidence of that in D-H. Perhaps in a warmer climate or in a very sheltered location it could overwinter.

Desert Tobacco is more widespread than Woodland Tobacco in North American deserts, but it is not present in D-H. I know of no instances of establishment of this or several other New World tobaccos on Old World continents. With its smaller flowers, nurseries are less likely to offer desert tobacco as an ornamental (Fig. 9.35.4).

**Fig. 9.35.4** Woodland Tobacco (photo © GR)





**Fig. 9.35.5** Silverleaf Nightshade (Horse Nettle) (*Solanum elaeagnifolium*)--SOLANACEAE. Silvery perennial 1-3ft tall reproduces by seeds and rhizomes. Entire plant covered by matted tiny starlike hairs and slender yellow spines. The spines are sometimes absent. **Leaves:** Alternate, lance-shaped, 1-4in long and 6-25mm wide. Margins wavy. **Flowers:** Yellow stamens surrounded by deep violet or blue 19-25mm wide petals. **Seeds:** **a.** berrylike hairless pods 8-12mm in diameter mottled green, becoming yellow or orange contain many seeds. **b.** seeds disk shaped, 3mm long, yellow-brown, shiny, and finely granular (Fig. 9.35.5 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

Weeds of Dewey-Humboldt, Arizona

### Silverleaf Nightshade (*Solanum elaeagnifolium*) [P|INM]

Like Crested Pricklepoppy, Silverleaf Nightshade's thorns and toxic sap make it cow proof. It flourishes in cow and horse pastures as the grazers remove the competition. Though this is a native weed, its name (*elaeagnifolium*) refers to its leaves' resemblance to introduced Russian Olive. The plant has spread around the world. Able to tolerate both arid and mesic conditions, Silverleaf Nightshade is a weed of national significance in Australia, and an invasive problem in many regions (e.g. Jordan, Qasem, Abdallat, and Hasan 2019).

High alkaloid concentration makes this weed one of our most poisonous. Other members of the SOLANACEAE are also poisonous, but some are edible. Tomato, potato, and eggplant are familiar edibles. The family connection is clear if you compare potato and Silver Nightshade flowers (Fig. 9.35.6).

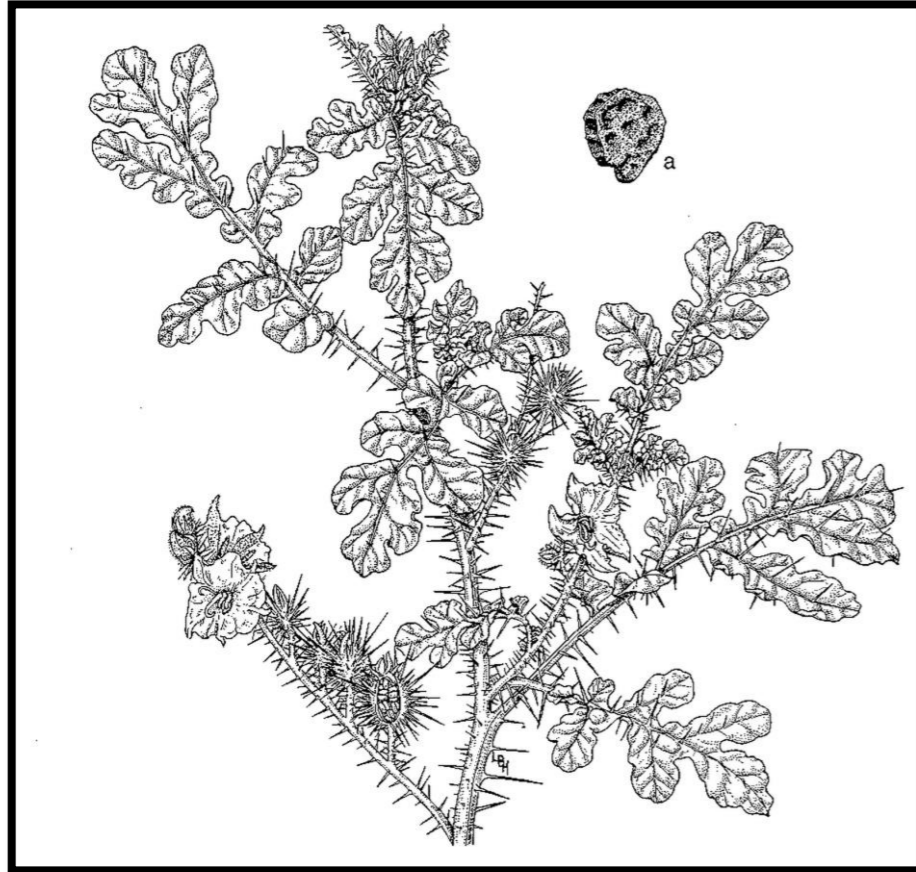
Silverleaf Nightshade's potent chemistry is a source of medicinal compounds. Moore (1989, 2003) doesn't mention the plant, but alkaloid use appears in literature cited on the website of the Southwest School of Botanical Medicine, Bisbee, Arizona (2019).



**Fig. 9.35.6** Silverleaf Nightshade (photo © GR)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]





**Fig. 9.35.7** Buffalobur (*Solanum rostratum*)--SOLANACEAE. Stems branching in upper part of plant are 6-24in long. Straight spines cover stems, leaf veins, and seedpods. Yellow flowers are five-lobed, 25-38mm wide. The spiny calyx enlarges and encloses the seedpod in a spiny bur. **a.** seeds are about 12mm in diameter (Fig. 9.35.7 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

### **Buffalobur (*Solanum rostratum*) [A|NP]**

People probably transported this native annual of the Great Plains to Arizona where it has spread along roads into yards, irrigated farms, and across overgrazed land. It now covers thousands of acres.

Kittie Parker (1972) called Buffalobur vicious, and when you find one, you'll agree. But more than appearing fiendish, the plant backs up its scary appearance with solanine, a glycoalkaloid poison in its leaves and stems.

Buffalobur became invasive when transported from its native home east of the Rocky Mountains. The plant requires livestock grazing or other disturbance to provide places for its seeds to germinate. Once established, it can hold its ground and prevent normal succession by other plants (Fig. 9.35.8).



**Fig. 9.35.8** Buffalobur (photo © Jerry Friedman)

## 9.36 TAMARISK FAMILY—TAMARICACEAE



**Fig. 9.36.1** Saltcedar (*Tamarix chinensis*)—TAMARICACEAE. Small tree 10-15ft high with long gray-green upright or spreading branches; often forms dense thickets. Bark brown and smooth becomes ridged and furrowed with age. **Leaves:** Deciduous, narrow, pointed (needle-like), about 2mm long often overlapping. **Flowers:** Deep pink to white crowded on slender spikes 1-5cm long form dense mass at ends of branches. **Seeds:** Pink to yellow pods 3-5mm long contain many seeds less than 1mm long with a tuft of silky hair. **a.** Flower. **b.** Seed with tuft of hair (Fig. 9.36.1 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

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**Saltcedar (*Tamarix chinensis*) [P|IM]**

(Five-stamen Tamarisk, Tamarack) For two years, my family lived on the Little Colorado River floodplain. Exploring the maze-like alleys and tunnels floored by inches of accumulated needles and roofed by arching branches gave me many hours of entertainment in the dense *Tamarix* woodland beside the river. This Eurasian native smothers most other plants that once populated the floodplain. It is present beside the Agua Fria River and in other moist locations. I cut all the clumps along the river in 1998. They have recovered, and it is time to cut them again. Left alone, they would spread to defeat the willows, walnuts, and cottonwood sprouts. According to contributors to the IUCN Global Invasive Species Database, this is one of the 100 world's worst weeds.

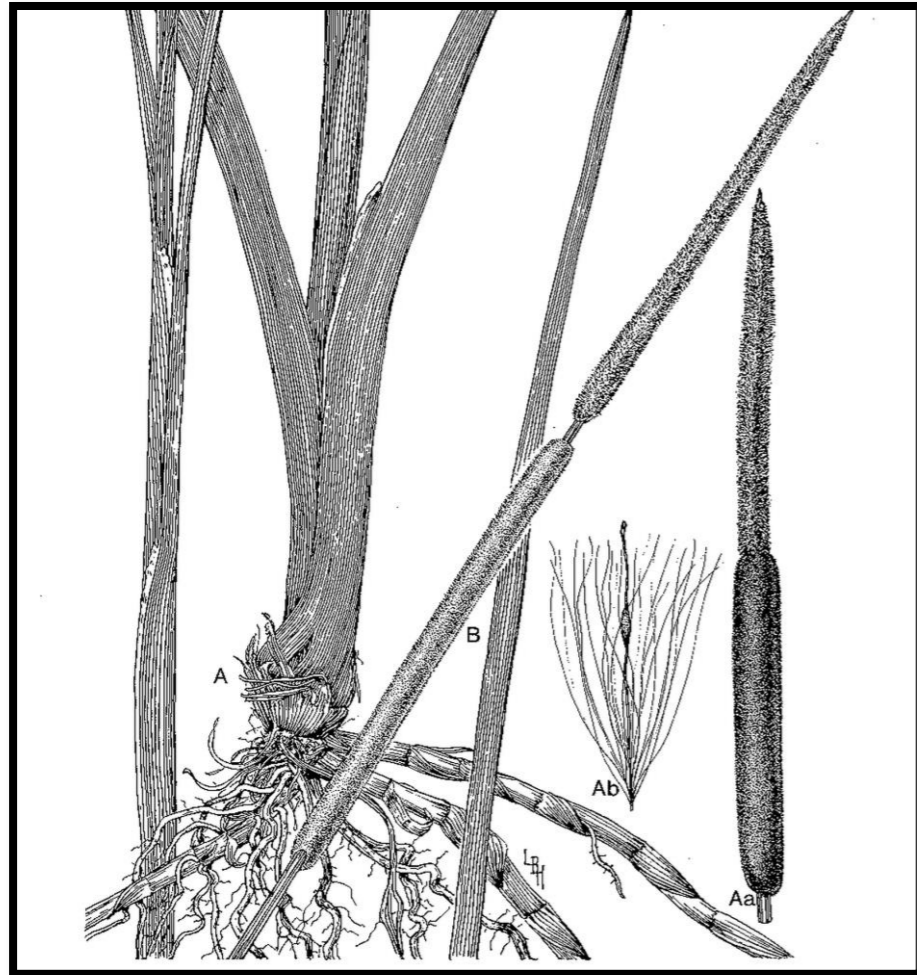
Gardeners use Saltcedar as a landscape ornamental, and it provides pollen for bees and cover for birds. The endangered Southwest Willow Flycatcher nests in the branches. According to SEINet, the plant is also useful for curing camel mange. Of course it is. Nevertheless, Saltcedar forests are impoverished places where few species live. Sad a day only they remain along our desert streams (Fig. 9.36.2).

**Fig. 9.36.2** Saltcedar flowers (photo © Arashiyama)



[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]

## 9.37 CATTAIL FAMILY—TYPHACEAE



**Fig. 9.37.1** Common Cattail (*Typha latifolia*)—TYPHACEAE. Four to seven feet tall. **Leaves:** Twelve to sixteen, flat 16-23mm wide. **Flowers:** Usually no space between the lower (female or pistillate) and upper (male or staminate) flowers. Flowers packed into a cigar shape 4-7in long and 2-3cm thick. Male flowers with 2-5 stamens fall as soon as the pollen sheds leaving the upper end of the spike naked. Female flowers, each with 40-60 fine hairs, persist for months. **Seeds:** Minute brown achenes 1-2mm long with fine hairs still attached when shed. **a.** Plant with rhizomes. **Aa.** Flowering spike; staminate flowers above, pistillate flowers below. **Ab.** Achene of **b** (Southern Cattail), not a current D-H resident (Fig. 9.37.1 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

**Common Cattail (Bulrush) (*Typha latifolia*) [P|DEN]**

Bulrushes are perennials that grow in freshwater marshes, along rivers, around ponds, and in irrigation canals. They were present in North and South America, Africa, and Eurasia when recorded history began. Since then, they have spread to Hawaii, Australia, and New Zealand. The plants reproduce from seed and rhizomes. They bloom from early to late summer.

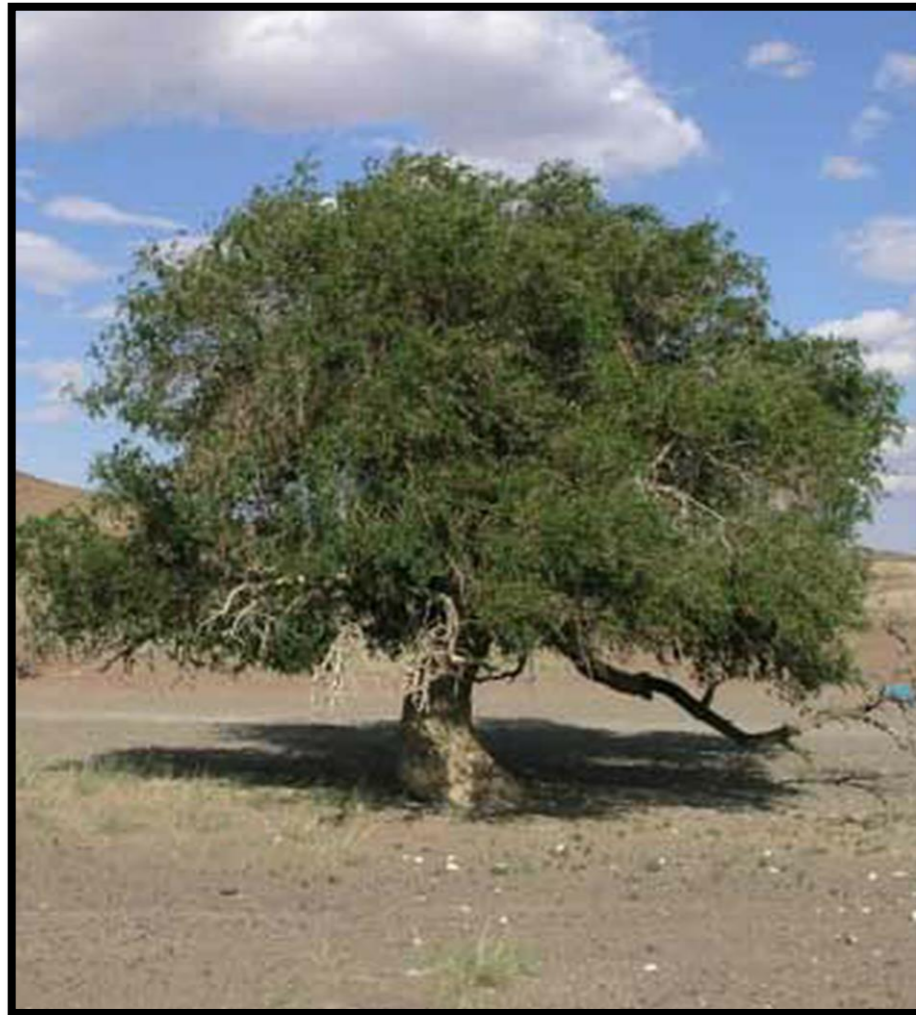
Shoots from the rhizomes form dense stands difficult to eradicate. Seasonal fluctuation of water level in ponds and desert streams, especially those that dry out, can create enough stress to prevent the plants from spreading. Elsewhere, people have eradicated Bulrush by repeated cutting below the water surface to deny oxygen to the roots and rhizomes.

Bulrushes are important members of the cool deserts' moist ecosystems. They stabilize disturbed areas and provide cover for ducks and other wildlife. They provide food for muskrats, they host moths, beetles and other insects, and their fruits and stems provide material for bird nests (Fig. 9.37.2).

**Fig. 9.37.2** Cattail in a pond near the Agua Fria River (photo © GR)



### 9.38 ELM FAMILY—ULMACEAE



**Fig. 9.38.1** Siberian Elm (*Ulmus pumila*)--ULMACEAE. Tree 15-30m tall, deciduous with gray to brown furrowed bark. **Leaves:** Blade lanceolate, 2-7cm long and 2-4cm wide, pointed, and single-toothed (most other elms are doubly toothed—i.e. their teeth have teeth). **Flowers:** In clusters of 5-15. **Seeds:** Tan, round, winged samaras, 10-14mm in diameter, notched tip (Fig. 9.38.1 photo © Tiarescott - TerraNova, le désert de Gobi)

### Siberian Elm (*Ulmus pumila*) [P|DEI]

This is the principal shade tree for many people living in arid regions similar to D-H. It casts dense shade, it is drought tolerant, and with regular water, it can grow 100ft tall.

This desert tree is an introduced invasive species illustrating the Janus nature of many weeds that can be both good and bad depending on time and place.

As many children will attest, the buds, leaves, flowers, and seeds are edible (Fig. 9.38.2).

**Fig. 9.38.2** Shiny toothed leaves (photo © Melburnian)



### 9.39 VERBENA FAMILY—VERBENACEAE



**Fig. 9.39.1** Prostrate Vervain (*Verbena bracteata*) Verbenaceae—VERBENACEAE. Low spreading annual or perennial 10-50cm tall usually less than 25cm. **Leaves** opposite, pinnate, 1-6.5cm long. **Flowers** tiny white, blue, or purple about 4mm wide. **Fruit**: 4 nutlets 2-2.5mm long (Fig. 9.39.1 photo © GR)

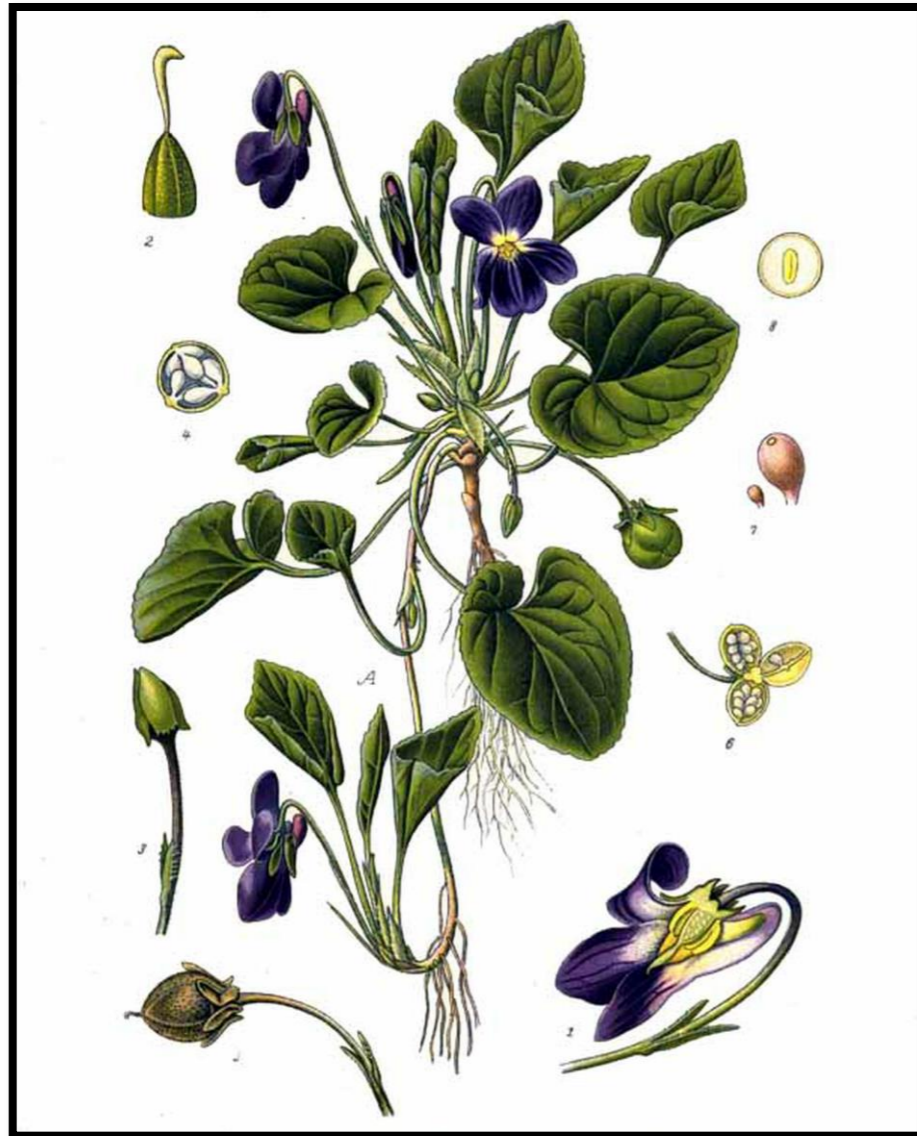
### Prostrate Vervain (*Verbena bracteata*) [A-B-P|**DMN**]

Prostrate Vervain appeared in 2014 and began spreading. It is doing its job covering exposed ground and it is doing it without producing irritating seeds or odor. A low mat-forming plant such as this is as effective as gravel in making the path navigable in wet weather. Its tiny flowers persist through the hottest months and attract a steady stream of tiny butterflies, so it gets to stay. Native throughout North America, Prostrate Vervain has dispersed to Europe and Japan. I do not know if it is invasive in those places, but of course, local weed managers should keep an eye on it (Fig. 9.39.2).

**Fig. 9.39.2** Prostrate Vervain flowers (photos © GR)



## 9.40 VIOLET FAMILY—VIOLACEAE



**Fig. 9.40.1** Sweet Violet (*Viola odorata*)--VIOLACEAE. Perennial with long green aboveground *cord-like runners* (stolens) that have thin roots or rhizomes at nodes. **Leaves:** On stalks arising from stolens, 2-6cm long, dense short hairs, rounded indented base, blunt tip. **Flowers:** White to deep blue, fragrant, 1-2cm long; five separate petals, all differently shaped. The two lateral petals have a beard of hairs near the base, and the base of the lowest petal forms a short, rounded spur or sac. **Fruit:** Purple eggshaped capsule opens from top releasing ivory seeds 3-4mm long. **Insets:** Lower left: Intact capsule. Lower right: Dissected flower (Fig. 9.40.1 painting: Amédée Masclef 1893)

Weeds of Dewey-Humboldt, Arizona

**Sweet Violet (*Viola odorata*) [P|D]**

My mother's favorite flower, this weed grew wild on the banks of 14-Mile Creek where we lived. I didn't think of it as a weed, and when it appeared at the edge of my back lawn, I was delighted. Then, after several quiescent years, the stolens shot outward in a dramatic and successful attack on the neighboring Bermudagrass. However, this may not be a problem; Javelina found the plant during the winter and began eating the new roots and shoots. Deer like the leaves (Fig. 9.40.2).



**Fig. 9.40.2** Sweet Violet invasion into the lawn from the original patch at left. The new plants are more yellow than the older plants (photo © GR)

[A=Annual, B=Biennial, P=Perennial | D=Delightful, E=Edible, F=Future Colonist, I=Invasive, M=Medicinal, N=Native, P=Painful, T=Tough, Z-1, Z-2=Noxious in AZ]

### 9.41 ALOE FAMILY—XANTHORRHOEACEAE



**Fig. 9.41.1** Onionweed (*Asphodelus fistulosus*)--XANTHORRHOEACEAE. Annual or short-lived perennial 20-70cm tall forms tubers at the stem base. **Leaves:** Hollow tubes with hairy edges. **Flowers:** Close at night. Racemes to open panicles on 15-70cm long branches. White to pale pink with dark pink or brown veins. Tepals (petals as in tulips and daffodils) 5-12mm long and 2-3mm wide. **Capsuls:** Round 5-7mm long with six seeds (Fig. 9.41.1 photo © 2008 Hans Hillewaert)

### Onionweed (*Asphodelus fistulosus*) [A|FI]

Livestock do not eat this Mediterranean weed. It is present in the U. S. Southwest, Mexico, and the Middle East. It invades and spreads across rangelands and other disturbed areas with winter moisture and summer warmth.

I haven't seen Onionweed in D-H. It grows in similar habitats and will probably reach us soon (Fig. 9.41.2).

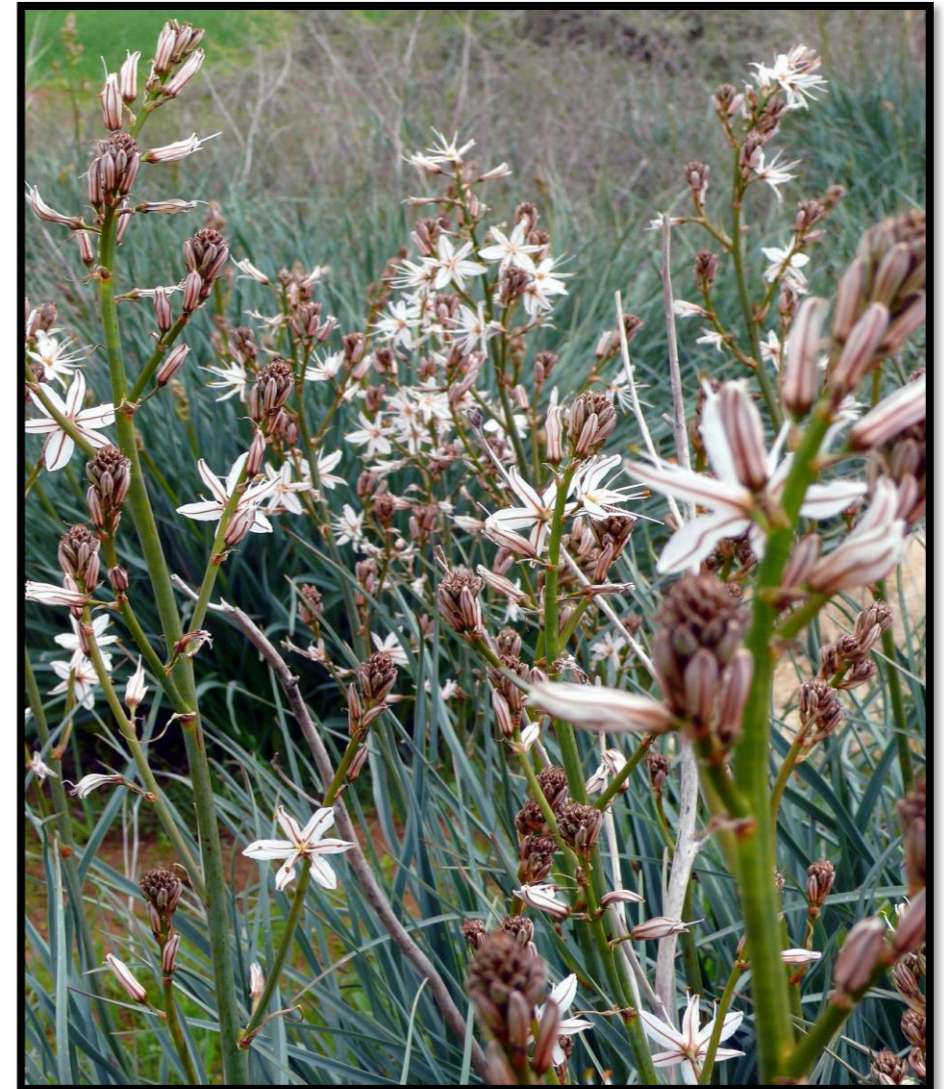
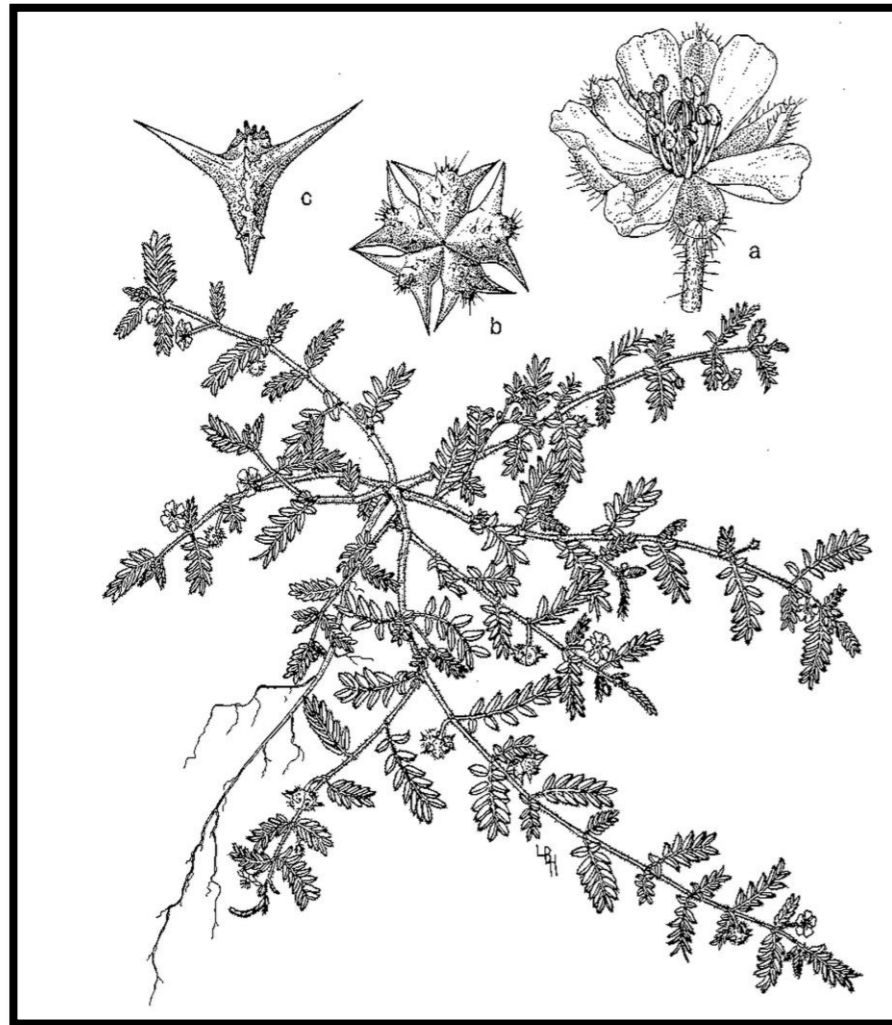


Fig. 9.41.2 Onionweed (photo © Shachar haCasi)

## 9.42 CALTROP FAMILY—ZYGOPHYLLACEAE



**Fig. 9.42.1** Bullhead (Puncturevine) (*Tribulus terrestris*)--ZYGOPHYLLACEAE. Spreading stems can form dense mats up to 10 feet in diameter. **Leaves:** Opposite, *pinnately compound* with 4-7 pairs of oblong leaflets 3-13mm long. **Flowers:** Bright yellow on short stalks have five petals open in morning. Similar to Creeping Woodsorrel (above). **Seedpods:** Cluster of five nutlets each with two vicious spines. Each nutlet contains 2-5 seeds capable of remaining viable for many years awaiting sufficient moisture for germination. **a.** Flower. **b.** Seedpod with five bony nutlets. **c.** Nutlet (Fig. 9.42.1 from *An Illustrated Guide to Desert Weeds*, by Kittie F. Parker. © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press)

**Bullhead (Puncturevine) (*Tribulus terrestris*) [A|MPZ-1]**

Bullhead's origin is uncertain, but Eurasia is a safe bet. It germinates wherever seeds land, but seems to be most common in vacant lots, dry yards, street edges and sidewalk cracks—all those places barefoot children walk or ride bikes with air-filled tires. On sunny mornings in mid to late summer, tiny yellow flowers expose Bullhead presence. The flowers resemble those of Creeping Woodsorrel (above). Check the leaves. Bullheads are pinnately compound and Woodsorrel's are more like clover. Stop and pull the plants. Left to mature, they produce seeds with spines so long, hard, and sharp they puncture bicycle tires and leave dogs and barefoot children yelping and hobbling in pain. Most vexing, seeds stuck to shoe soles detach in carpet where they lie waiting for opportunities to animate the shoeless.

Two weevil species (*Microlarinus* spp.) native to France, Italy, and India can reduce Bullhead numbers. The weevils are available from biological supply companies, but they often do not survive long enough to eliminate all the plants. The best solution is to pull the plants before they drop any seed. Keep this up for a few years and the problem fades away. The plant is a regulated pest in Arizona. This means viable plant parts (stolons, rhizomes, cuttings and seed, except agricultural, vegetable and ornamental seed for planting purposes), found within the state may be controlled to prevent further infestation or contamination (Fig. 9.42.2).

**Fig. 9.42.2** Bullhead patch of pain (photo © Forest and Kim Starr)





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## GLOSSARY

Botanical terminology has a history stretching back thousands of years. Some of the terms we use to label plant parts are unique to botany, but most of them are forms of common adjectives.

This glossary is limited to terms used in this book. For a more complete list, I recommend the Glossary of Botanical Terms on Wikipedia and the fine book by David Gledhill (Gledhill 2008). The definitions below are from several sources, but I tended to follow Parker's plain style (Parker 1972). Wikipedia has illustrations for most of them.

Achene - Small dry one-seeded fruit in which the ovary wall is free from the seed

Acuminate - Gradually tapering to a sharp point

Acute - Sharp pointed but less tapering than acuminate; angle less than 90 degrees

Allelopathic - Produces biochemicals that prevent the germination, growth, survival, or reproduction of neighboring plants

Alternate – Single leaves attached at a node

Annual - Plant that usually germinates, flowers, and dies in one growing season

Anther - Enlarged part at the top of the stamen; bears the pollen

Attenuate - Gradually narrowing to a slender apex or base

Auricle - Some grasses have small claw-like extensions of the collar that separates the sheath from the blade

Awn - More or less stiff bristle on the end of lemmas (lower bracts) or glumes (paired bracts)

Axil - Upper surface of angle between the stem and the leaf

Blade - Grass leaf above the sheath

Bract - Modified leaf underneath a flower or inflorescence

Bristle - Stiff, slender appendage

Bunchgrass - Grass without stolons or rhizomes; growth forms a bunch

Bur - Rough or prickly envelope around a seed or fruit

Calyx - Outer set of floral leaves, usually green, composed of all the sepals

Campanulate – Bell-shaped.

Caryopsis - Dry one-seeded fruit in which the ovary wall unites with the seed coat, typical of grasses

Ciliate - Fringed with hairs on edge

Collar - Region of the outer side of the grass leaf at the junction of the blade and sheath

Compound - Leaves divided into leaflets

Convolute - Rolled longitudinally

Corolla - All the flower petals

Corymb (adj. corymbiform) is a flower array or cluster with outermost flowers on longer pedicels than the inner

Creeping - Spreading just under the surface of the soil

Culm - Stem of grass plants

Cyathia - Euphorbia flowers appear to be individual flowers, but they are composed of bracts fused into a cup (involucre), with peripheral nectary glands supported by petal-like (petaloid) bracts. Within the cup, there is a ring of male flowers, each with a single stamen. Out of the middle protrudes a single, stalked female flower with no petals

Deciduous - Sheds leaves at the end of the growing season. Induced by cold temperature or by drought

Decumbent - Stems that lie flat and turn up at their ends

Decurrent - Extending downward from the point of attachment

Dehiscent - Splitting open at maturity

Dioecious - Plants with only male (staminate) flowers

Disk flowers - Tubular flowers in the center of the flower heads in the aster/sunflower family

Distally - Opposite point of attachment

Embryo - Young plant enclosed in a seed

Entire - Continuous smooth leaf margin

Entity - Natural vegetation unit defined by particular plant species

Erose - Irregularly notched at the apex; appearing gnawed or eroded

Flexuous - Bent alternately in opposite directions, a wavy form

Floret - Individual grass flower including its two bracts, lemma and palea, or flower heads in the sunflower family

Floret - Small flower in the spikelet of the grasses, or the flower head of the sunflower family

Flower head - Dense inflorescence of sessile (stalkless) flowers

Fruit - Seed case or seed pod (the ripened ovary); containing one to many seeds

Geniculate - Bent sharply, like a knee

Glabrous - Smooth without hairs

Glands - Secreting tissue

Glaucous - Powdery or waxy surface cover

Glumes - Two thin bracts surrounding the spikelet of a grass (forming the husk of a cereal grain); or one surrounding the florets of a sedge

Grain - The seed-like dispersal unit of the grass family

Hirsute - With straight rather stiff hairs

Weeds of Dewey-Humboldt, Arizona

Hispid - With long stiff hairs

Hyaline - Colorless and translucent

Imperfect - Flowers with either pistils or stamens; unisexual

Indehiscent - Not opening at maturity

Inferior ovary - Sepals, petals, and stamens appear to rise from the very top of the ovary

Inflorescence - Flowering part of a plant

Internode - Part of a stem between two successive nodes

Introduced - Species people brought to North America

Invader - Undesirable plants that invade and replace native vegetation

Involucre - Cluster of bracts below the inflorescence or cone (involucrate = having an involucre)

Involute - Rolled inward on the upper (dorsal) surface

Keel - Central dorsal ridge; the two united petals in some legume flowers

Knotty - Hardened mass at the base or nodes

Lacerate - Appearing torn at the edge or irregularly cleft

Leaflet - Division of a compound leaf

Lemma - Lower bract of the two bracts of a grass floret

Ligule - A thin lining on the inner side of the leaf sheath at its junction with grass and sedge blades

Ligule - the membranous, toothed, or hairy appendage on the inside of a leaf exposed at the junction of the sheath and blade

Membranous - Thin, like a papery membrane

Monocarpic - Flowering and bearing fruit once and then dying; can apply to annuals, biennials, or perennials

Monoecious - Plants with only female (carpellate) flowers

Mycorrhiza - Formed by a combination of underground threads usually associated with plant roots

Native of - Species for at least the past 500 years living in a region or continent

Nerve - Vein on glume, lemma, or palea

Node - Place on a stem where leaves and branches originate

Nutlet - Small nut; the one-seeded portion of a larger fruit that separates at maturity

Obtuse - blunt or rounded (apex or base), usually making an angle of more than 90 degrees

Opposite - Leaf pairs together one on each side of the stem

Ovary - Base of the female part of the flower (pistil); ripens into the fruit

Palea - Innermost of the two bracts of a grass floret

Panicle - Loose, irregularly branched inflorescence with stalked individual flowers

Weeds of Dewey-Humboldt, Arizona

Pappus (plural pappi) - Modified calyx of a disk or rayflower in the sunflower family; consists of awns, scales, or bristles at the apex of the achene. Facilitates wind dispersal

Pedicele - Stalk of a spikelet

Perennial - Plant living more than 1 year

Perfect flowers - Both male and female reproductive parts in the same structure

Perianth - Outer part of flowers, consisting of the calyx (sepals) and corolla (petals)

Petaloid – Petal-like

Phyllary – In asters, a bract that with others forms the involucre or cup that holds the flowers

Pilose - Covered with soft hair

Pinnate - Leaf divided into leaflets along a central stem

Pistil - Female reproductive structures of a flower

Polycarpic - Produces flowers or spores more than once during lifetime

Pubescent - Covered with soft hairs

Raceme - A flower cluster with the separate flowers on short equal stalks at equal distances along a central stem (rachis). The flowers at the base of the central stem develop first

Ray flower - Marginal petal flowers in the inflorescence of the aster/sunflower family

Reniform - Kidney-shaped

Retorse - Directed back or down

Rhizomatous - Having rhizomes

Rhizome - Horizontal underground stem

Rosette - Cluster of spreading or radiating basal leaves

Rotate – Wheel-shaped usually applied to a circular, nearly flat, short-tubed, sympetalous corolla.

Runner - Horizontal aboveground stem; a stolon

Samara – Winged achene

Scabrous - Roughened with stout projections

Scurf (adj. scurfy) – Small branlike scales on the surface of a leaf or other part.

Sepal - One of the outer set of floral leaves forming the calyx, usually green

Sessile - Stalkless leaves or flowers

Sheath - In grasses, the basal portion of the leaf forms a tube (sheath) wrapping around the stem

Silicles - Dry, dehiscent fruit of the Brassicaceae with two parts that separate at maturity; fruit is typically *less than three times as long as wide*

Siliqua - Dry, dehiscent fruit of the Brassicaceae with two parts separating at maturity; fruit is typically *more than three times as long as wide*

Weeds of Dewey-Humboldt, Arizona

Sinuate, sinuous (adv. Sinuately) – Having a deep wavy margin.

Sod-grass - Grass with stolons or rhizomes; may form continuous thatched surface

Spatulate - Narrow at the stem widening to the tip

Spike - An unbranched inflorescence with stalkless flowers

Spikelet - the part of a grass inflorescence consisting of two glumes and one or more florets

Stamen - The male portion of the flower

Stipules - Pair of tongue-like appendages at the base of the leaf

Stolon - Horizontal stem that roots along its length to form new plants, aboveground or at very shallow depth

Stoloniferous - Bearing stolons

Striate - Marked with slender, longitudinal grooves or lines, appearing striped

Strigose - Stiff, straight hairs laying on a surface

Succulent - Soft and fleshy in texture

Tomentose - Covered by dense matted and tangled hairs, velvety

Truncate – “Cut off” at the base or apex

Truncate-ciliate - Ligule with short fringe of hair tips

Tuber - A swollen underground stem

Umbel – Flower stalks arising from a common point a bit like an umbrella blown inside out

Utricle – Small thin-walled fruit with a covering looser and more fragile than that of an achene. Common among Amaranths. The Tumble Pigweed drawing and one of the photos illustrate the utricle

Villous- Densely hairy with long, soft hairs

Whorl - Three or more leaves or flowers arising from the same node

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