

# Invasive weeds on rangeland

## Controlling sweet resin bush and yellow star-thistle

By Joanne Littlefield

Weeds can have an adverse effect on land, animals and humans. Land managers concerned about the negative impact of two invasive plants on Arizona rangelands have turned to University of Arizona College of Agriculture and Life Sciences (CALs) researchers for information on the best ways to control these weeds.

**Sweet resin bush** (*Euryops subcarnosus*, subspecies *vulgaris*), a low-growing, medium-sized shrub, was planted on western rangelands in the 1930s in an attempt to curtail soil erosion and provide forage for livestock. Neither strategy worked. CALs associate rangeland specialist Larry Howery says the plant is both invasive and unpalatable: domestic and wild ungulate (hooved) herbivores won't eat it, and in parts of Arizona, its sprawl in semi-arid grasslands has nearly wiped out native plants by using more water, sunlight and nutrients.

At the Santa Rita Experimental Range in southeastern Arizona, plant biologists are researching various eradication and management techniques. Howery is looking at control methods that include mechanical removal along with application of an herbicide, followed by careful monitoring for new sweet resin bush plants and hopefully, reestablishment of native plants. "Without follow-up monitoring we would have no way to document whether or not our efforts on the Santa Rita were successful," he says.

State and federal rules determine that a non-native plant can be considered a "noxious weed" when it has a "negative impact on agriculture, navigation, fish, wildlife, or public health." The Arizona Department of Agriculture is responsible for regulating noxious weeds, which often can be controlled but not eradicated. In fact, noxious weeds in general are notoriously difficult to control. In 1998 sweet resin bush, which is native to Africa, was officially listed on Arizona's State Noxious Weed List.

Sweet resin bush is one example of a plant intentionally introduced that has become invasive and has decreased the productivity of grazing land. Many other noxious weeds have been moving across the country through farm fields and on rangelands after initially being transported by European settlers and pioneers in grain seed, livestock feed and ship ballasts.

In the early 1990s a few private citizens near Young, (east of Payson in central

Arizona), noticed that a yellow-flowered weed with sharp spines was beginning to take over pastureland. It was positively identified as **yellow star-thistle** (*Centaurea solstitialis* L.), a species listed as a noxious weed in California and Idaho. It has since been listed as a noxious weed in Arizona. Because of its rapid spread since its unintentional introduction in California around 1850, it is considered one of the most serious rangeland weeds in the U.S. By 1995 it was estimated that it had infested 10-12 million acres in California alone. Current estimates for California are between 15-22 million acres.

Probably introduced in Arizona from contaminated hay, yellow star-thistle is a 2-to-3 foot tall annual plant that can cause "chewing disease" (equine nigropallidal encephalomalacia), a fatal disease in horses, with symptoms similar to Parkinson's disease in humans. Because of its bitter taste, horses usually avoid grazing yellow star-thistle, although they will resort to eating it in pastures lacking adequate amounts of suitable green forage.

Like many invasive plants, yellow star-thistle develops into dense, impenetrable stands that displace native vegetation in natural areas and in rangeland by out-competing it for sunlight, soil moisture and nutrients. Looking for an alternative to costly repetitive herbicide applications, land managers in the Pleasant Valley area around Young, Arizona tried biological control on yellow star thistle several years ago using a method that was somewhat successful in California. They imported the tiny hairy weevil, an insect that feeds on the plant. Drought, cold weather and guinea hens apparently kept the weevil from surviving in Pleasant Valley, which is located near the Mogollon Rim in central Arizona.

Howery is looking at other means of controlling yellow star thistle. "Our study includes suppressing the weed by mowing or applying herbicide to keep seeds from sprouting," he says. "This is followed by seeding the area with native grasses that will hopefully out-compete yellow star-thistle for soil moisture and soil nutrients." Howery knows this combination may not wipe out the weed. "What we may find is that while it may not be possible to totally eradicate it, we hope it will be present in much lower densities." w



Yellow star-thistle

Larry Howery

### MORE INFORMATION

The general public can help by reporting sightings of sweet resin bush or yellow star thistle. A reporting sheet is contained in back of the new "Arizona Invasive Plant Booklet," available for \$4.00 plus shipping and handling from Clare Hydock, Verde Ranger Station, PO Box 670, Camp Verde, AZ 86322-0670. Call (928)567-4121, or email [chydock@fs.fed.us](mailto:chydock@fs.fed.us).

### NOTE

These evaluation projects are a coordinated education effort between CALs, New Mexico State University and the Natural Resources Conservation Service (NRCS).

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