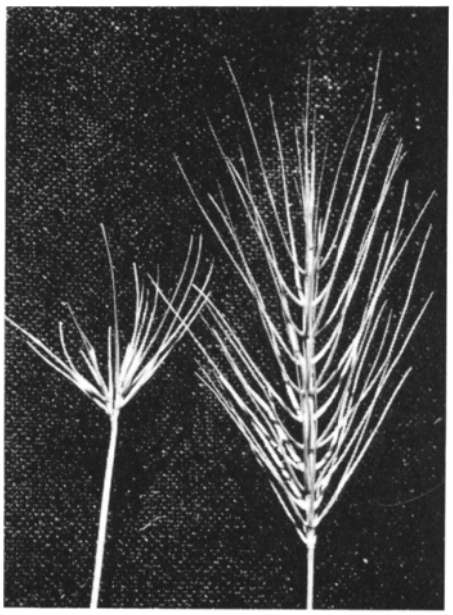
Weeds on California Rangelands

medusa head, goatgrass, and Italian thistle, major invading noxious weeds, are serious threat to desirable forage plants

Jack Major



Medusa head on the right has two sessile florets and two sets of awns per node. *Hordeum hystrix* on the left has one set of three florets at each node with the two lateral ones smaller and pediceled. The photograph shows the winter condition of both plants.

The grazing capacities of many California rangelands are seriously decreased by weeds—undesirable plants—that crowd out the desirable range plants, change the season of best range use, injure foraging animals, and make even more difficult the establishment of better varieties of forage plants.

Klamath weed and medusa head are the two leading noxious range plants. Successful biological control of Klamath weed is being achieved with beetles. Therefore, the vast expanses of bronze-green medusa head—so prominent in spring after the rest of the annual vegetation has dried and browned—make medusa head the most distinguished noxious range weed in at least one third of California.

Various thistles give trouble on rangelands. Italian thistle is spreading in open oak woodland. Yellow star thistle, which causes local brain necrosis in horses, is prominent in summer after the grain harvest. Milk thistle and tocalote, although widespread within California, are considered bad range weeds only in the southern Coast Range.

Tarweeds are a widespread pest on foothill and valley ranges, and goatgrass is a locally pressing problem in the central Sierra foothills.

Other troublesome weeds of California rangelands include:

The widespread foxtails—Hordeum hystrix, leporinum, and brachyantherum;

Hairy oatgrass—Danthonia pilosa—in the north coast counties;

Scotch broom—Cytisus scoparius or Sarothamnus scoparius—now abundant in parts of the Sierra foothills and becoming widespread in the San Francisco Bay and north coast areas;

Gorse—Ulex europaeus—bad in coastal northeastern California and getting started in the Sierra foothills;

Himalayan blackberry—Rubus procerus—in north coastal California;

Coyote brush—Baccharis pilularis—in the San Francisco Bay area;

Chamise—Adenostema fasciculatum—widespread and abundant;

Manzanitas — Arctostaphylos spp. — widespread, but the numerous species do not behave similarly as range pests;

Juncus—mostly J. effusus—and Iris spp. along the north half of the coast;

Mediterranean sage—Salvia aethiopis—in Modoc County.

POISONOUS PLANTS

Larkspurs—Delphinium spp.—in dry foothill areas;

The widespread loco weeds—Astragalus spp.;

Lupines—Lupinus spp.—bush species on the coast and the herbaceous species on the Coast Range foothills;

Fiddleneck—Amsinckia spp.—typical of old grainlands;

Halogeton glomeratus in eastern Lassen County;

Milkweeds—Asclepias spp.—in the Coast Range;

Hemlock—Conium maculatum— in the south coast ranges in wet areas;

Cocklebur—Xanthium canadense—on flood plains or other wet areas; and

Bracken—Pteris aquilinum or Pteridium aquilinum—in northeastern, humid, formerly densely forested California.

The native plants—lupines, larkspurs, loco weeds, and tarweeds, for example—have a natural place in the vegetation of California because they evolved with that vegetation. They are adapted to the places where they grow and have spread little. If these native plants were killed

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Medusa head typically grows in dense masses to the exclusion of other forage plants.

Yellow Tip of Citrus

application and biuret content of urea affect extent of leaf tip chlorosis

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Yellow tip—a chlorosis of the tips of citrus leaves—results either from foliage sprays or from soil applications of urea containing an excess of biuret.

As a foliage spray, urea containing no more than 0.25% biuret is commercially safe at the rate of 7½ pounds of urea for 100 gallons of water. A very small amount of yellow tip may result from such a spray but is of no practical importance. When yellow tip occurs from urea sprays, because of too high a biuret content in the urea, it occurs only on the leaves that are sprayed. Once yellow tip develops, the affected leaves do not regreen. Growth flushes occurring after the spray are not injured.

Soil applications of urea—of various biuret content—as related to the development of yellow tip, were studied in the spring of 1954. Urea from four sources—containing four levels of biuret—was applied as a soil application to navel orange trees in the long-term fertilizer experiment at Riverside. Applications were such as to supply three pounds of nitrogen per tree. The trees were observed throughout the season for the development of yellow tip.

A second experiment under way in Santa Barbara County is a comparison of urea foliage sprays with soil applications of urea on lemons. Foliage sprays supply in one case one-third pound of nitrogen, and in another, one pound of nitrogen per tree, as compared to three pounds of nitrogen per tree applied in four applications to the soil. The first applications were made in March 1955. The urea used for foliage sprays contained 0.15% biuret, and that for soil application, 2.00% biuret.

Yellow Tip from Soil Application of Urea Containing Various Amounts of Biuret

Urea No.	% Biuret	Amount of Yellow Tip
1	0.15	none
2	0.78	none
3	2.12	trace
4	3.58	moderate

In the Riverside experiment, no yellow tip resulted from the soil application of ureas containing 0.15% or 0.78% biuret. Urea containing 2.12% biuret caused a trace of yellow tip, but of no practical importance. The urea containing 3.58% biuret caused a moderate amount of yellow tip and probably should not be used.

In the Santa Barbara County experiment—with lemons—no yellow tip had developed, as of November 1, 1955.

In the Riverside experiment on oranges, all of the three pounds of nitrogen were applied in one application, but for the lemons at Santa Barbara, it was split into four applications.

The amount of yellow tip resulting from soil applications appears to depend on the amount of biuret applied at any one time. There is no accumulation of biuret in the soil. It is broken down by soil organisms in about six weeks.

There is a variable percentage of biuret in urea from lot to lot, and from one manufacturer to another. Biuret determinations have been made on urea samples from seven different manufacturers. Most of these were found to contain 2.5% or less of biuret.

Based on experimental results, urea containing up to 2.5% biuret is safe to use—insofar as biuret injury is concerned—as a soil application to oranges and lemons. A trace of yellow tip may result from urea containing 2.5% biuret, but is of no practical importance.

Urea containing more than 0.25% biuret—used as foliage sprays—will cause yellow tip on citrus.

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WEEDS

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in local spots, the prolific annual plants among them probably would come back unless the pattern of land use were drastically modified—by irrigation or fertilization of rangelands, for example.

Medusa head, Italian thistle, and goatgrass are among those plants which are not native to California, and—in their homelands—they are not the pests they are here. If efficient and inexpensive control methods can be found, these noxious weeds can be permanently replaced by better forage plants.

Prescribed burns, herbicidal sprays—which are constantly being improved and new ones invented—seeding of better species, and range fertilization are control methods being tested. The State Division of Forestry has done considerable burning of medusa head while its seeds were in the milk or soft dough stage. Significant reductions in infestations resulted.

Medusa head sites in Shasta County seeded to introduce subterranean—*Trifolium subterraneum*, rose—*T. hirsutum*, and crimson—*T. incarnatum*—clovers have recovered spectacularly.

Knowledge of the noxious plants and their relationships to their environment is so limited that it can not be predicted how far Halogeton—for example—will spread, or whether goatgrass will grow everywhere medusa head does.

It is known that Italian thistle does not behave in California as it does in the different climate of England, where the city of Plymouth has set aside a park to preserve the plant. However, it is not known to what feature of climate, or other factor, the spreading ability of the thistle in California can be attributed.

About 1903, medusa head had just invaded California from Oregon. In 1955, it covers great areas—in Siskiyou, Shasta, Tehama, Glenn, Colusa, Lake, Humboldt, Mendocino, and Solano counties—with a dense blanket of useless, inedible, wirelike grass which is still a bronze-green color several weeks after useful annual forage plants have dried up. Furthermore, medusa head has migrated south as far as the mountains of Santa Barbara County.

To control invading noxious plants successfully, it must be determined why a given plant grows where it does. Until that can be done with more accuracy than present information permits, control of such weeds as medusa head, goatgrass, and Italian thistle is problematical.

In the meantime—because foreign plants will invade where natural vegetation is disturbed—California's rangeland should be kept with as complete and as vigorous a plant cover as possible, to limit the areas of further spread of range weeds. Chemical sprays, prescribed burns, reseeding, and grazing management must be used—particularly on the periphery of an invasion—to hold back the spread of noxious range plants.

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University of California County Farm Advisors co-operated in the state-wide survey which supplied much of the information contained in this report.