

Rangeland plants not readily grazed by livestock generally have been considered undesirable weeds that should be eliminated. Many plants regarded as weeds, however, are intricate components of the grassland ecosystem. Therefore, it is important to distinguish between desirable rangeland species and weeds that adversely affect forage or livestock production.

## Weeds and Forbs

A weed is any plant growing where it is not wanted. In general, weeds are opportunistic plants that compete with desirable forage for moisture, nutrients, and space. Forbs are broadleaf herbaceous plants that may be either desirable or undesirable. The presence and abundance of weeds and forbs help determine range condition, and are useful indicators of management problems.

Livestock routinely graze forbs to help meet nutritional and dry matter requirements. Native legumes such as catclaw sensitivebriar, partridgepea, and leadplant are palatable and provide a good source of protein. Some perennial forbs, such as blacksamson and compassplant, are relished by livestock and will decrease under heavy grazing. As stocking rate increases, desirable forb production decreases (Figure 1).

Grazing intensity also influences the relative abundance of undesirable forbs and grasses. Perennial forbs such as verbena, goldenrod, and ironweed, and many annual forbs, such as broomweed and snow-on-the-mountain, are not eaten by cattle and increase on overgrazed rangeland. Annual bromes (Japanese brome, downy brome, and cheat) will persist in lightly and moderately stocked pastures; however, in heavily stocked pastures, the annual bromes are grazed out and replaced by little barley, an unpalatable annual grass.

Some weeds are unpalatable when mature but are grazed when young. Western ragweed contains over 20 percent crude protein and is palatable in the early growing season, but cattle will not eat mature ragweed. Annual bromes also provide forage in the early growing season,

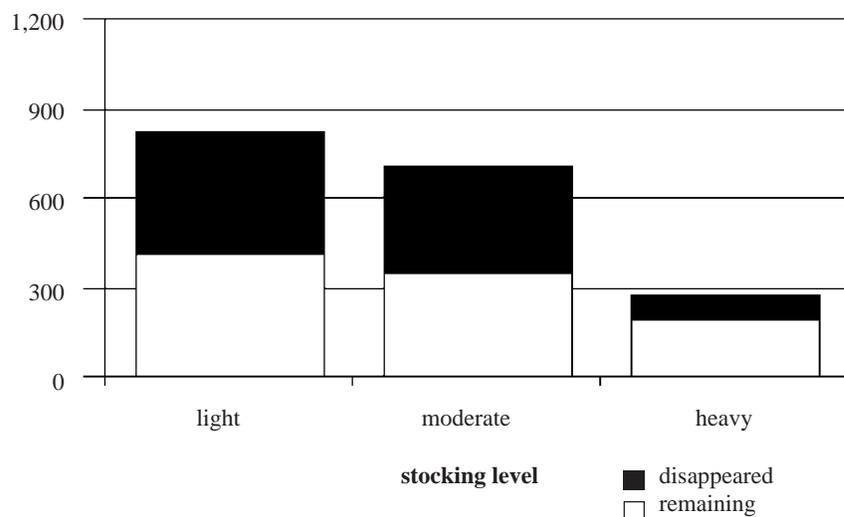
although extensive stands will reduce warm-season grass production and overall livestock gains.

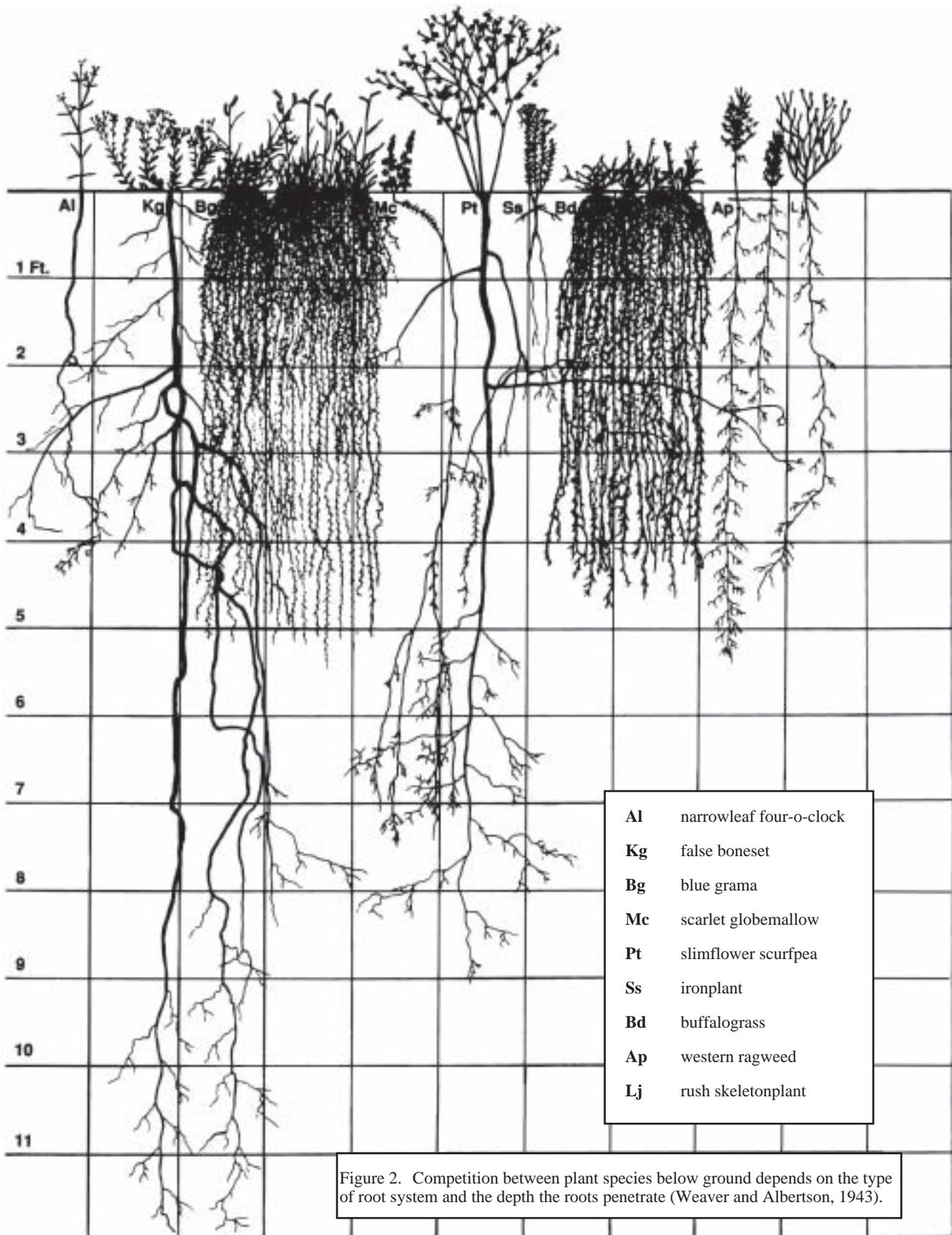
Removing weedy species that compete with perennial grasses can increase forage production. Rhizomatous forbs, such as asters and goldenrods, have fibrous root systems that compete with grasses for water and nutrients. However taprooted forbs, such as scurfspea and false boneset, have extensive root systems that extract water from deeper soil horizons than grasses (Figure 2).

Forbs can actually benefit grass production by modifying the microclimate. By providing shade and shelter from the wind, forbs reduce evaporation and temperature of nearby grass plants, which increases water use efficiency. In Kansas midgrass prairie, blue grama and buffalograss yields are increased if western ragweed is present in amounts up to 1,200 pounds per acre.

Weeds are pioneer species in the succession of disturbed sites. Annual weeds can respond rapidly to fluctuations in temperature and moisture, and are more opportunistic than perennials. Low precipitation and above normal temperatures in the spring produce favorable conditions for warm-season annual weeds (e.g., green and yellow bristlegrass). Disturbed sites, heavily grazed pastures, and bare areas caused by spot grazing are particularly susceptible to annual weed invasion whenever a wet spring follows a dry year.

**Figure 1.** Perennial forb production at Hays decreases as stocking level increases (Launchbaugh and Owensby, 1978).





Some weeds may not directly reduce herbage production but can adversely affect livestock performance. Dense stands interfere with grazing and hinder livestock travel. Weeds with spiny leaves, awned seeds, or a pungent odor discourage grazing of nearby forage.

### **Wildlife Habitat**

A balance of grasses, forbs, and woody plants increases habitat diversity and benefits wildlife. Edge, the boundary between different vegetation types, also is important in providing food, protection, and space. As a rule, good grazing management is not detrimental to wildlife.

Many forb species provide forage for wildlife, and are important in attracting and maintaining wildlife populations. Forb seeds, such as sunflower and ragweed, have higher energy content than wheat and sorghum and are valuable food sources for many birds.

### **Control Methods**

Controlling unwanted plants can be expensive and difficult. Poisonous, noxious, and invading weeds that are not compatible with range forage should be targeted for control. Many “weeds” are actually beneficial to livestock and wildlife, and the consequences of their removal should be considered before a control program begins. Because species respond differently to control attempts, accurate identification of the undesirable weed is important for successful management.

Forage production decreases as weed encroachment increases; at some level, weed populations become high enough to warrant control. To be justified, control of undesirable species must increase forage production or availability for livestock. Reducing unwanted plants to a tolerable level generally is more economical than attempting to eliminate them. Cost effectiveness increases when weeds are controlled on sites with high production potential, such as lowlands and meadows.

### ***Grazing Management***

Grazing management is the most economical way to manage weeds. Livestock will graze many weeds early in the growing season. Continuous, moderate stocking allows cattle to select weeds and cool-season grasses that are growing before the warm-season perennial grasses emerge. Because their growing points are exposed, forbs are weakened more than grasses by repeated grazing.

The competitive ability of warm-season perennial grasses is improved if rangeland is periodically rested

during the last half of the growing season. For yearling cattle operations, intensive stocking in the first half of the growing season and then resting the pasture from grazing, can effectively reduce many weed species and improve range condition. The absence of late season grazing supplies abundant fuel for burning the following spring. Additionally, an overwintering mulch layer protects the soil and provides an environment that is unfavorable for the establishment of annual weeds.

Selective grazing by different kinds of animals also can affect weed populations. Livestock and wildlife species prefer different types of forage. Horses eat very few forbs and their intense grazing pressure on grasses favors weed establishment. Sheep eat less grass and more forbs than cattle and will consume many forb species that are unpalatable to cattle. Deer and goats primarily consume forbs and browse, and generally do not compete with cattle for forage.

### ***Prescribed Burning***

Fire played an important role in the development of the Great Plains grasslands. Prescribed burning is a valuable tool for managing weed and grass populations in the tallgrass prairie. Most annual weeds and grasses and many undesirable perennial forbs can be controlled with fire.

The response of forbs to fire depends upon the timing of the burn. Prescribed burning in late spring when the forbs are actively growing is the best time to control most forbs. Burning in early spring increases perennial forbs but generally reduces warm-season grass production. Prairie threeawn is unique because it must be burned in November to be controlled. Biennial weeds that are in the rosette stage are not controlled by fire. Fire should be used with caution in western Kansas because soil moisture loss may reduce forage production.

### ***Mechanical Control***

Mechanical controls such as hoeing and grubbing are effective but are labor intensive and expensive. Consequently, mechanical control measures are only feasible for small or scattered patches. Often, grubbing initial invading weeds can prevent severe infestations. If tap-rooted weeds such as musk thistle are dug, the root must be cut several inches below ground to prevent regrowth.

Mowing weed-infested areas temporarily removes top growth but often stimulates vigorous regrowth. Because desirable forage is also clipped, mowing should be limited to dense weed stands. Undesirable annual grasses should be mowed after the seed stalk has elongated but before seeds mature.

Annual forbs can be controlled by cutting below the lowest leaf early in the growing season. Annual forbs also may be mowed before seed formation, but many species become woody at maturity and remnant stems can injure livestock feet. Mowing may be aesthetically satisfying, but it seldom eliminates annual weeds because viable seed in the soil and dispersal from surrounding areas continually invade. Mowing generally is not effective in controlling perennial forbs, although repeated mowings will reduce their vigor and limit their spread.

### **Herbicides**

Applications of 2,4-D and other herbicides have reduced forb populations on many grasslands. Removing all forbs from rangeland with indiscriminate spraying, however, is not desirable. Elimination or large scale reduction of beneficial forbs will reduce animal gains, disturb wildlife habitat, and produce a plant community that has a shortened season of high quality forage.

Herbicides are most effective on annual weeds that are in the seedling stage or less than 8 inches tall. Biennial species require two years to complete their life cycle and are easiest to control in the rosette stage. Perennial weeds are most susceptible to herbicides during the bud to early-bloom stage. Optimum weed control is obtained if conditions that are favorable for plant growth follow the herbicide application. Careful and selective use of herbicides, combined with proper management, can hasten recovery of weed-infested areas.

Apply only herbicides labeled for the target weed species and registered for rangeland use. Application equipment should be accurately cali-

brated to obtain maximum weed control and prevent environmental damage.

**Follow label instructions carefully and use herbicides with caution. Consult a county extension office for the latest recommended chemicals.**

### **Summary**

Weed management is an important factor in properly managing rangeland. Determining whether or not a "weed" is detrimental is the first step of a control program. Weed infestations are often the symptom of underlying problems, and unless the problem is corrected, weeds will recur. The key to weed management is recognizing potential problems and controlling them before they become serious.

### **References**

- Launchbaugh, J. L., and C. E. Owensby. 1978. Kansas rangelands: their management based on a half century of research Kansas Agricultural Experiment Station Bulletin 622. pp 28-32.
- Weaver, J. E., and F. W. Albertson. 1943. Resurvey of grass, forbs and underground plant parts at the end of the great drought. Ecological Monographs 13:63-118.
- Related Publications
- Range Grasses of Kansas (C-567)
  - Prescribed Burning Safety (L-565)
  - Prescribed Burning: A Management Tool (L-815)
  - Prescribed Burns: Planning and Conducting (L-664)
  - Rangeland Brush Management (MF-1021)
  - Stocking Rate (L-690)
  - Grazing Distribution (MF-515)
  - Chemical Weed Control for Field Crops, Pastures, Rangeland, and Noncropland (Report of Progress issued annually)

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