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Mowing to Manage Noxious Weeds

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Mowing can stress noxious weeds and favor growth of desired plants. In a Montana study, spotted knapweed density was decreased about 85 percent by one mowing during the flowering stage.

Few studies have been conducted on the effects of mowing plant communities and noxious weeds, and virtually no long-term studies have been conducted on rangeland. However, the ecological basis of mowing to manage noxious weeds and to favor desired plants is conclusive. Since leaves collect carbon dioxide and sunlight, defoliation alters competitive abilities. Mowing undesired plants decreases their competitive abilities and favors desired plants if proper timing, frequency and height of mowing are considered for each vegetative situation. This usually is based on the growth rates and growth stage of vegetation.

The purpose of this document is to provide principles to consider when developing a mowing program as part of an integrated weed management plan.

Timing

Properly timed mowing can suppress noxious weeds while favoring desired plants. Timing is based primarily on the growth stage of the plants to be mowed and secondarily on the growth stage of the desired plants. The most effective time to mow noxious weeds is when the desired plants are dormant and weeds have reached the flowering stage. Mowing during this time can prevent weed seed production and weaken the weeds after they have invested a large amount of energy for bolting (when the stem extends from the center of the rosette upwards two to four feet

and producing reproductive structures. Long-term repeated mowing during this growth stage can eventually deplete root reserves. If regrowth bolts again and produces flowers, an additional mowing is necessary for a mowing strategy to be effective.

Some desired plants, like grasses, have equal amounts of growth above and below ground. When grasses are defoliated during the growing season, this stress reduces vigor and competitive ability—to maintain competitiveness and to allow grasses to produce seed for next year's stand, it is best to mow when these plants are dormant. [Mowing during the weeds' seeding period can facilitate seed dispersal.]

If desired vegetation cover is inadequate (usually less than 20 percent), you may need to revegetate the area (see the MontGuide *Rehabilitation of Weed-Infested Rangeland* MT9811).

Effective mowing of large infestations is a long-term commitment. Some weeds, such as those that spread through rhizomes—a prostrate stem growing beneath the soil surface—have large energy storage capacities. During the first few years, mowing these weeds can stimulate shoot production from root buds and increase stem densities. However, over time, frequent mowing at each early flowering stage can affect underground reserves and eventually reduce stem densities. The following noxious weeds are rhizomatous:

- Canada thistle, *Cirsium arvense*

- Dalmatian toadflax, *Linaria dalmatica*
- leafy spurge, *Euphorbia esula*
- meadow hawkweed, *Hieracium pratense* (= *H. caespitosum*)
- ox-eye daisy, *Chrysanthemum leucanthemum*
- Russian knapweed, *Acroptilon repens*
- whitetop or hoary cress, *Cardaria draba*

Mowing frequency

Mowing frequency depends upon precipitation and the mowing tolerances of the vegetation—a function of relative growth rates, leaf replacement potential and the plant's ability to increase photosynthesis after mowing to compensate for leaf loss. Carbon allocation patterns in plants also help determine ability to mowing tolerance. Particularly important are the number, location and source of growing points on plant stems. An effective mowing strategy minimizes the removal of growing points of desired plants and maximizes removal of growing points of weeds.

For annual, biennial and taprooted perennials, the frequency of mowing depends primarily on precipitation. A single midsummer mowing after flower production can reduce or eliminate seed production and shift the balance in favor of desired species in areas with little or no summer rain. In one study, 78 percent control of diffuse knapweed (*Centaurea diffusa*) was achieved after mowing to a two-inch height each month during the grow-