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## EC55-109 Pasture Weed and Woody Plant Control

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# *Pasture Weed And Woody Plant Control*

- mowing
- use of chemicals
- pasture management

EXTENSION SERVICE  
UNIVERSITY OF NEBRASKA COLLEGE OF AGRICULTURE  
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# PASTURE WEED AND WOODY PLANT CONTROL

By D. F. Burzlaff and J. D. Furrer

An important step to increase production of many unproductive pastures is elimination of weeds. Each year weeds rob farmers in eastern Nebraska of one half to three fourth of the desirable forage the pastures are capable of producing. Weeds use valuable moisture and plant food that can be utilized for producing forage for extra pounds of beef and milk.

## Methods Of Controlling Weeds In Pastures

The problem of controlling weeds in pastures has been attacked in two ways:

### Mowing

For many years the standard recommendation for weed control in pastures has been clipping with a mowing machine at a time when the weed has exhausted most of its root reserves. For most plants this critical period is from the bud to early-bloom stage. The theory behind this practice is to destroy the plant parts which manufacture food at the time when the food supply stored in the roots from the previous year is lowest. This results in reduced vigor and eventual death of the plant.

It is now evident that even though mowing may be successful in some instances, it is not an adequate means of eradicating or controlling all pasture weeds.

## "Advantages" of Mowing

1. It is a relatively inexpensive program. Almost every farmer has a mowing machine and no capital outlay for equipment is necessary.
2. It is non-selective. Mowing is effective on weedy grasses as well as broad leaf weeds.
3. It is especially effective on annual and biennial weeds if accomplished before seed production occurs.
4. It does not eliminate legumes as is the case with spraying.

## "Disadvantages" of Mowing

1. Results have been unsatisfactory in a large number of instances.
2. Unused forage produced by desirable grasses is clipped off and lost as feed.
3. Mowing is often delayed until seed is mature or root reserves have been restored and the weeds are prepared for re-growth.
4. Different kinds of troublesome weeds do not reach the proper stage of development for effective control by mowing at the same time. It is generally necessary to mow several times during the season to control all undesirable species.

## Recent Research on Mowing

Results after six years of research by the University of Nebraska Agricultural Experiment Station (1950-55) revealed the following facts about mowing as a means of controlling weeds in pastures.

1. Mowing resulted in a decrease of total forage production from the pasture.
2. At best, mowing resulted only in a decrease in vigor of most weeds. Satisfactory control was not obtained on any species of perennial pasture weeds.

3. Some annual weeds were satisfactorily controlled.

### Chemical Control

With the use of 2, 4-D and other selective herbicides as a means of controlling weeds, pastures in Nebraska should take on a new appearance. Results from weed control plots at Lincoln show 75 to 90% control of the major broad leaf weeds as a result of applications in four successive years of 1 pound of 2, 4-D ester early in June.

#### "Advantages" of Chemical Control

1. After treatment for four consecutive years 75 to 90% of the perennial broad leaf weeds can be eliminated.
2. On land too steep or rough for mowing or other mechanical treatment sprays can be applied by airplane.
3. The use of the pasture is not lost and it is not necessary to provide supplemental feed while weeds are eliminated.
4. Increases in forage production can be expected after the first year of the treatment.
5. Commercial application of herbicides is available in most communities. This relieves the farmer of the need for investing in equipment and from interference with his work schedule.

#### "Disadvantages" of Chemical Control

1. Critical periods of application often interfere with other farm work.
2. Special equipment is needed. However, sprayers are more common on farms now with increased use of insecticides and herbicides.
3. Cost per acre may be higher for spraying than it is for mowing.

4. Desirable legumes are lost as a result of spraying with 2, 4-D compounds. Weedy grasses are not eliminated by weed sprays commonly used.

## Chemical Control Of Common Pasture Weeds

Factors that affect growing conditions of plants also affect the results obtained with 2, 4-D and 2, 4, 5-T. Weeds are most easily killed with herbicides when they are growing rapidly. Good soil moisture and fertility and warm temperatures bring about rapid plant growth which is necessary for good kills with 2, 4-D and 2, 4, 5-T. Plants which are stunted because of low soil fertility, moisture, or extreme temperatures will be difficult to kill. Perennial plants which have been mowed or disturbed by disking or plowing shortly before 2, 4-D and 2, 4, 5-T is applied will be more difficult to kill than undisturbed plants.

Most annual weeds can be killed with one timely application of the recommended rate of chemical. Sometimes a second spraying is necessary to control late emerging plants. Fall (October or early November) or early spring treatments appear to be equally effective on most fall annuals and biennials. To obtain good control many perennials require treatment for two or more consecutive years.

Soil sterilants can be used on small patches of hard-to-kill perennial weeds such as Russian knapweed, Canada thistle, hoary cress, leafy spurge, bur ragweed, and field bindweed. Apply sodium chlorate at 4 to 6 pounds per square rod, boron-chlorate mixtures at 8 to 12 pounds, boron materials at 12 to 15 pounds, and CMU at 1/2 pound per square rod. (CMU does not control leafy spurge).

When sodium chlorate is used as a soil sterilant it is necessary to pulverize any large lumps of material. Because the chemical has a salty taste, animals tend to lick any large lumps and livestock poisoning may result.

Table 1. -- Troublesome Pasture Weeds and Recommended Chemical Control. The letters in parenthesis following each weed indicate if it is a common annual (A), fall annual (FA), biennial (B), or perennial (P). The amount and kind of chemical to apply and the time to treat is given to the right of each species. On most perennials ester forms of 2, 4-D are more effective than amine salt.

<u>Weed</u>	<u>Amount and Kind of Chemical Per Acre and Time to Treat</u>
Annual ragweed (A)	1/2 to 1# 2, 4-D, early summer
Asters (P)	1# 2, 4-D, early summer; repeat treatments
Beggar's ticks (A)	1/2 to 1# 2, 4-D, early summer
Black nightshade (A)	Resistant to 2, 4-D and 2, 4, 5-T, mow early summer
Boneset, False (P)	1 to 2# 2, 4-D, mid-summer for 2 or more years
Buffalo bur (A)	Resistant to 2, 4-D and 2, 4, 5-T, mow early summer
Bull thistle (B)	1# 2, 4-D, late fall on rosettes or in spring before flowering
Burdock (B)	1# 2, 4-D, late fall on rosettes or in spring
Bur ragweed (P)	1 to 2# 2, 4-D ester in June; repeat treatments
Cactus, prickly pear (P)	1# 2, 4, 5,-T ester in 5 gal. diesel fuel as wetting spray in September
Canada thistle (P)	1# 2, 4-D at early bud; repeat treatment in fall; treat 2 or more years
Cocklebur (A)	1/2 to 1# 2, 4-D, late spring
Dandelion (P)	1# 2, 4-D, late fall or early spring
Dock (P)	1# 2, 4-D, late fall or early spring
Dogbane (P)	1# 2, 4-D, early spring; repeat treatments
Field bindweed (P)	1# 2, 4-D, at bud stage or in late fall; repeat treatments
Fireweed (Kochia) (A)	1/2 to 1# 2, 4-D, early to late spring
Giant ragweed (A)	1/2 to 1# 2, 4-D, late spring to early summer
Goldenrod (P)	1 to 2# 2, 4-D, early summer; repeat treatments
Ground cherry (P)	Resistant to 2, 4-D and 2, 4, 5-T, mow early summer



<u>Weed</u>	<u>Amount and Kind of Chemical Per Acre and Time to Treat</u>
Gumweed (P)	1/2 to 1# 2, 4-D, late spring or early summer
Hemp (A)	1/2 to 1# 2, 4-D, late spring or early summer
Hoary cress (P)	1# 2, 4-D, at bud stage; repeat treatment in fall; treat for two or more years
Horse nettle (P)	1# 2, 4, 5-T, early summer
Ironweed (P)	1# 2, 4-D, late spring; treat for 2 or more years
Jimson weed (A)	1# 2, 4-D, late spring or early summer
Leafy spurge (P)	1 to 2# 2, 4-D, at early bud stage; repeat treatment in fall; 2 or more years
Locoweed (P)	1/2 to 1# 2, 4-D, late spring
Marestail (A)	1# 2, 4-D, late spring or early summer
Marsh elder (A)	1/2 to 1# 2, 4-D, late spring or early summer
Milkweed (P)	Resistant to 2, 4-D and 2, 4, 5-T
Mullen (B)	Resistant to 2, 4-D and 2, 4, 5-T
Pennycress (FA)	1/2 to 1# 2, 4-D, late fall or early spring before bloom
Peppergrass (FA) or (A)	1/2 to 1# 2, 4-D, early spring
Poison hemlock (B)	2# 2, 4-D ester, before the bud stage
Prickly poppy (A)	1/2 to 1# 2, 4-D, early spring
Puncture vine (A)	1/2 to 1# 2, 4-D, late spring or early summer
Ragweed, perennial (P)	1# 2, 4-D, early summer; repeat treatments
Rocky Mt. Bee Plant (A)	1/2 to 1# 2, 4-D, early summer
Russian knapweed (P)	Resistant to 2, 4-D and 2, 4, 5-T; 1 to 2# 2, 4-D/A at pre-bud stage will stop seed production

<u>Weed</u>	<u>Amount and Kind of Chemical Per Acre and Time to Treat</u>
Russian thistle (A)	1# 2, 4-D, late spring
Sand sage (P)	1# 2, 4-D, late spring
Shepherd's purse (FA)	1/2 to 1# 2, 4-D, early spring
Smartweed (A)	1 to 2# 2, 4-D, late spring or early summer
Snow-on-the-mountain (A)	1# 2, 4-D, early summer
Soapweed (Yucca) (P)	1# 2, 4, 5-T ester in 5 gal. diesel oil applied as wetting spray in mid-spring
Stiffleaf goldenrod (P)	1# 2, 4-D, late fall or early spring
Sunflower (A)	1/2 to 1# 2, 4-D, late spring or early summer
Tanweed (P)	1 to 2# 2, 4-D, late spring; repeat when 8 to 10" growth appears; treat 2 or more years
Thistles (except Canada)	1# 2, 4-D, late fall on rosettes or in spring
Velvetleaf (A)	1# 2, 4-D, late spring or early summer
Vervain (P)	1 to 2# 2, 4-D, late spring; treat for 2 or more years
Water hemlock (P)	2# 2, 4-D ester, before the bud stage
Yarrow (P)	1 to 2# 2, 4-D, late spring; treat 2 or more years
Yellow goatshead (B)	1# 2, 4-D, late spring
Yucca (P)	(See soapweed)

High rates of 2,4-D have been used successfully for the control of hard-to-kill perennial weeds. Treatments of 80 pounds 2,4-D per acre (1 pint of 40% amine salt 2,4-D per square rod) should be applied after November 1 and before April 1. The high rates of 2,4-D cause little damage to grasses. If properly applied, almost 100% control of perennial broad leaf weeds can be accomplished.

## Chemical Control Of Woody Plants<sup>1/</sup>

Woody plants present problems in many of our Nebraska pastures. Such species as willow, wild rose, buckbrush, sumac, plums and osage orange not only interfere with movement of livestock in a pasture, but also decrease production of desirable grasses and make uniform use an impossibility.

The killing of trees and large brushy species can be done as effectively in the winter as in the summer. Spraying the leaves of trees in the spring and summer is known as foliage application. Spraying trees in the winter time is referred to as dormant spraying.

### Foliage Spray Applications

Plants are considered in full foliage after most of the leaves on the new shoots have attained full growth and normal color. Foliage treatments for large trees require the use of a wetting spray (high gallonage) containing the recommended amount of chemical (table 2) in 100 gallons of water. High gallonage applications, are usually made with hand guns. Low volume applications containing the recommended amount of chemical (table 2) in 10 gallons of water are usually sufficient for the smaller shrubby species.

<sup>1/</sup> Taken in part from Agronomy Department Circular 100 of the Nebraska Agricultural Experiment Station.

## Dormant Spray Applications

Oil instead of water is used to dilute the chemicals for dormant spraying. Only the ester forms of 2, 4-D and 2, 4, 5-T should be used with oil. Dormant spraying can be done in two ways, "cut stump treatment" and "basal trunk treatment." The pounds of chemical listed to the right of each species in table 2 should be mixed with 10 gallons of diesel fuel, kerosene, or stove oil. This is an effective ratio for either cut stump or basal trunk treatments.

Cut Stump Treatments. To prevent sprouting, the best results are obtained and smaller amounts of chemical are used if the trees are cut off close to the ground. The cut surface of the stump and the bark to the ground line must be thoroughly wet with the chemical and oil mixture if effective results are to be obtained.

Basal Trunk Treatments. Where it is impractical to cut the trees first the lower 18 inches of the trunk can be sprayed with an oil and chemical combination. The lower portion of the tree must be completely wet to the ground line. In general, small trees are more easily killed than large trees. Cottonwoods up to 13 inches in diameter have been killed by this method.

## Pasture Management

The effectiveness of any weed control program will depend upon the management practices the farm operator is willing to follow with regard to grazing of the livestock. Adjustments in stocking rates or in time of use are required to obtain maximum forage production.

Native warm-season grasses--big bluestem, switchgrass, sandlove, side oats grama, little bluestem, buffalo, and blue and hairy grama--are producing the best forage during the hot summer months. To maintain this type of pasture in a high state of productivity it is necessary to delay grazing until mid-June or early July. This makes it necessary to provide additional forage for early spring grazing.

Table 2. -- Woody Plants That Are Troublesome in Pastures. The amount and kind of chemical to apply and the time to treat is given to the right of each species. The pounds of chemical recommended for control is the amount to use for high and low gallonage foliage sprays, as well as for cut stump and basal trunk treatments.

<u>Woody Species</u>	<u>Amount and Kind of Chemical Per Acre and Time to Treat</u>
American elm	2 to 4# 2, 4-D ester, full foliage or dormant
Ash	4# 2, 4-D and 2, 4, 5-T mixture, full foliage or dormant
Black locust	2 to 3# 2, 4-D ester, at full foliage or dormant
Box elder	2# 2, 4-D ester, full foliage or dormant
Buckbrush	1 to 2# 2, 4-D ester, May 15 to early June
Bur oak	2 to 4# 2, 4-D and 2, 4, 5-T mixture, full foliage or dormant
× Chinese elm	1 to 2# 2, 4-D ester, full foliage or dormant
Chokecherry	2 to 4# 2, 4-D and 2, 4, 5-T mixture, late spring or early summer
× Cottonwood	2# 2, 4-D ester, full foliage or dormant
Dogwood	4# 2, 4-D and 2, 4, 5-T mixture, late spring or early summer
Gooseberry	2 to 3# 2, 4, 5-T ester, late spring or early summer
Hackberry	2 to 4# 2, 4-D and 2, 4, 5-T mixture, full foliage or dormant
Hawthorn	2 to 4# 2, 4-D and 2, 4, 5-T mixture, late spring or early summer
Honey locust	3# 2, 4, 5-T ester, full foliage or dormant
Mulberry	4# 2, 4-D and 2, 4, 5-T mixture, full foliage or dormant
Osage orange	2 to 3#, 2, 4, 5-T ester, full foliage or dormant
Plum	2 to 3# 2, 4-D ester, full foliage or dormant
Poison ivy	2 to 3# 2, 4, 5-T ester, late spring or early summer
Red elm	2 to 4# 2, 4, D and 2, 4, 5-T mixture, full foliage or dormant
Sand sagebrush	1# 2, 4-D ester, late May or early June
Sumac	1 to 2# 2, 4-D ester or amine, full foliage or dormant
Wild rose	2 to 3# 2, 4, 5-T ester, late spring or early summer
× Willows	2# 2, 4-D ester, full foliage or dormant

Early grazing may be furnished by temporary or permanent pasture crops. Rye, Rye and vetch, or second-year sweetclover are excellent temporary pastures. Cool-season plants such as bromegrass, intermediate wheatgrass, and crested wheatgrass with alfalfa, trefoil, or sweetclover provide excellent permanent pasture for early grazing.

In eastern Nebraska where many of the warm-season grasses have been replaced by bluegrass, it may be best to manage the pasture as a cool-season forage crop. The use of nitrogen fertilizers and the introduction of such legumes as Korean lespedeza or birdsfoot trefoil will increase the benefits of the weed control program.

During the hot summer months when cool-season pastures are not producing enough forage for the livestock, sudan grass furnishes excellent supplemental grazing. Warm-season grasses may be used as a permanent pasture to provide forage during the summer drouth.

Under ordinary conditions it is not necessary to remove livestock from the pasture after spraying weeds with 2, 4-D or 2, 4, 5-T. These chemicals are not poisonous to livestock. When poisonous plants are being sprayed, it is wise to remove the grazing animals for a few days. The action of the chemical sometimes influences the amount of the poisonous plant material consumed by livestock.