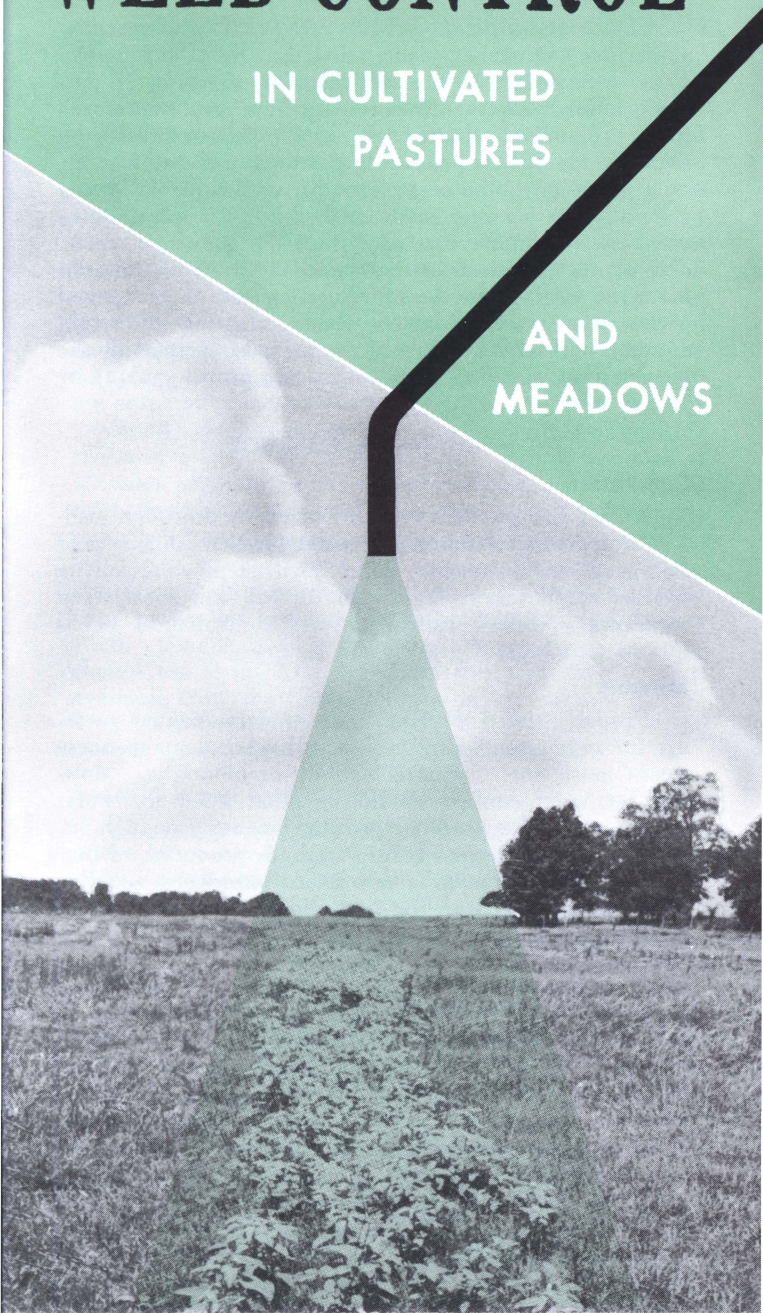


WEED CONTROL

IN CULTIVATED
PASTURES

AND
MEADOWS



TEXAS AGRICULTURAL EXTENSION SERVICE
J. E. Hutchison, Director, College Station, Texas

Suggestions herein for use of chemicals to control pasture and meadow weeds are based on agronomic effectiveness. Follow directions on the USDA approved labels on the containers. If this precaution is observed, there should be no danger from chemical residues.

WEEDS COMPETE WITH PASTURE and meadow plants for moisture, plant nutrients, light and space. They often reduce pasture and meadow yields by 50 percent. Weed control is necessary for greatest returns from productive pastures and meadows, but it may be unprofitable on low-producing pastures or meadows.

Prevention is the best means of weed control. Weeds generally are a minor problem in dense, vigorous stands of grass. Practices that encourage the growth of desirable plants tend to discourage weeds. Much of the need for weed control can be prevented by thorough seedbed preparation, using adapted plants, planting the right amount of high-quality seed by the best method at the proper time, adequate fertilization and proper grazing or forage use.

MECHANICAL CONTROL

Cultivation

Killing one or more crops of weeds by thorough seedbed preparation reduces the weed problem during and following establishment. After the first plowing during seedbed preparation, light disking will kill most weed seedlings. Shallow cultivation will control most weeds in row plantings of grasses and legumes.

Mowing

Properly timed mowing is an effective control measure for most broadleaved weeds. Mowing damages these weeds most when they are budding or blooming. Mowing for weed control should be done when the worst weeds are in this stage of growth, but early enough for all weeds to be mowed before seed are produced. Bitter sneezeweed, commonly called eastern bitterweed, requires repeated mowing, with the first clipping just low enough to catch the blooms and successive mowings lower to prevent seed production on the mowed stubble. Yankee-weed, incorrectly called rosinweed, and other fall-blooming perennial weeds should be mowed in the summer to retard growth and again at blooming time in the fall.

In addition to weed control, mowing removes coarse, mature growth on pasture and meadow plants and stimulates new growth that is more palatable and nutritious. Bermuda and other sod-forming grasses may be mowed at a height of 3 to 4 inches. Blue panic, buffel and many other bunch grasses should be mowed no closer than 6 to 10 inches. When it is necessary to mow seedling stands of alfalfa for weed control, set the mower high enough to pass over the young alfalfa plants. If the alfalfa plants are about as tall as the weeds, delay mowing until the alfalfa is in the one-fourth bloom stage.

The two types of mowers commonly used are the cutter-bar type and the rotary or shredder type. The rotary type is faster, requires less maintenance and tends

Weed Control in Cultivated Pastures and Meadows

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to shred the weeds into short pieces so that there is less danger of shading desirable plants.

CHEMICAL CONTROL

Spraying for pasture weed control is cheaper, faster and more effective than mowing. Weeds often resprout after mowing, but proper spraying frequently gives near complete control for one season. When all expenses are considered, one spraying costs about the same as for one mowing, but it often is more effective than three mowings. Thus, weed control by spraying might be obtained for one-third or less the cost of control by mowing. Another advantage of spraying is that none of the grass or other desirable pasture plant growth is clipped off but remains for grazing or use as hay.

Chemicals

2,4-D is the basic pasture and meadow herbicide. Active material in 2,4-D solutions is expressed in terms of pounds of acid equivalent per gallon. Most, but not all, 2,4-D concentrates contain 4 pounds of acid equivalent per gallon. Recommendations are based on pounds of 2,4-D acid equivalent per acre. The material as used on pastures and meadows is not poisonous to livestock.

The two most common forms of 2,4-D are the amine salt and the low-volatile ester. The amine form is suggested for use on pastures and meadows because it is less hazardous to susceptible crops, is about as effective and usually costs 50 percent less than the low-volatile ester form. The low-volatile ester form is suggested for use only in drier areas where conditions are less favorable for control with the amine form. Following an application of low-volatile ester, 2,4-D vapor may drift to susceptible plants, resulting in some damage. The high-volatile ester form of 2,4-D should never be used for weed control in pastures and meadows. The butyric form of 2,4-D, 4(2,4-DB), is useful in controlling broad-leaved weeds in stands of alfalfa and whiteclover.

Dalapon and *TCA* are used to control undesirable grasses. They are available in dry, water-soluble form. They are selective for grasses at the low rates suggested.

Selective dinitros sometimes are used for the control of winter annual broad-leaved weeds in alfalfa. They are poisonous, should be used carefully and should not be sprayed on forage near the time it is to be grazed or fed.

Amino triazole is available as a 50 percent wettable powder. It is useful for spot treatment of undesirable plants in pastures and meadows.

Ammate is useful for spot treatment of certain plants in pastures and meadows. It is available as water-soluble crystals.

Wetting agents often are suggested for use with 2,4-D and dalapon to permit more thorough coverage of weedy

plants. An excellent wetting agent is $\frac{1}{2}$ to 1 cup of liquid laundry detergent per 100 gallons of water. Dry detergent at the rate of $1\frac{1}{2}$ to 2 pounds per 100 gallons of water may be used, if the detergent is dissolved before it is added to the spray solution.

Sprayers

Chemicals suggested herein for pasture and meadow weed control are applied in a water solution as a spray. Good coverage on the weeds is necessary. A boom-type sprayer with nozzles near the ground allows more accurate placement and minimizes drift. The boomless-type, or wide-swath, sprayer with a single nozzle or a cluster of nozzles is more maneuverable around trees, brush, fences and buildings, is adapted for use at higher speed, is easier to hitch, store and clean and is relatively inexpensive to build and maintain. Spray swaths from boomless sprayers must be overlapped 2 to 3 feet to obtain good coverage. Pasture sprayers should operate at about 30 pounds pressure and never more than 40.

For information on sprayers, nozzles, pumps, pressure regulators and gauges and on sprayer calibration, see Extension Bulletin 892, *Weed Control in Texas Pastures*. Instructions for building a boomless-type sprayer are given in Extension Plan 441, *Plans for a Wide-Swath Pasture Sprayer*. The pump, gauge, regulator, lines and nozzle for such a sprayer may be obtained for \$80 to \$100. Details on converting cattle sprayers to pasture sprayers are given in Extension Plan 457, *Plans for Pasture and Range Weed Sprayer*.

Time of Application

Apply herbicides when weeds are in the young, rapid-growth stage and have enough foliage to catch the chemical solution. Use of chemicals when weeds are growing slowly because of drouth or are approaching maturity generally results in poor control. Broad-leaved weeds are killed more easily when they are in the seedling stage. Near-perfect control is obtained many times when they only have two leaves. Some annual weeds, such as croton or goatweed, germinate and begin growth later than others and the spray application sometimes has to be delayed until the late-starters have begun growth.

Herbicides discussed in this leaflet for the control of annual grasses should be applied when the grasses are in the seedling stage with no more than four or five leaves.

The best temperature range for the action of herbicides is 70 to 80 degrees F. The 55 to 90 degree F. range generally is satisfactory. Most herbicides are not sufficiently active when the temperature is below 50 degrees F. Grasses may be injured if 2,4-D type herbicides

Note A:

For Amino Triazole:

Remove all livestock before treatment. Do not apply after October 1. Do not graze or cut for 8 months after treatment.

are applied as a spray when temperatures are above 95 degrees. F.

To avoid possible injury to nearby susceptible crops, such as cotton, alfalfa, watermelons, tomatoes and others, applications of 2,4-D may need to be made to perennial grass pastures and meadows before susceptible crops start growth. Many operators in cotton-growing areas stop using 2,4-D when cotton is planted to be sure of avoiding damage to that crop. Excellent control of most broad-leaved weeds generally is obtained with this timing, even though many of the weeds are just beginning growth. Some broad-leaved weeds start a new crop of seedlings with fall rains, and effective weed control by spraying may be obtained after cotton and other susceptible crops have matured.

Wind velocity should be 5 miles per hour or less for the most effective spray application. Winds or gusts of 10 miles per hour or more distort the spray pattern and drift the chemical enough so that nearby susceptible crops may be damaged and poor weed control may result. Use a wind gauge to determine the wind velocity accurately before spraying. Plans for making a simple wind gauge are given in Texas Station Progress Report 1466. Simple, pocket-size wind gauges may be purchased for about \$5. The State Herbicide Regulations, available from the Commissioner of Agriculture, Austin, Texas, set out minimum distances for spraying in the vicinity of cotton with various wind velocities.

Specific Weed Control Suggestions

The suggestions following will take care of most situations where weed control is needed. For detailed information on the control of individual weeds, see Extension Bulletin 892.

1. PERENNIAL GRASS PASTURES AND MEADOWS

Use 1 pound of 2,4-D amine per acre in 15 to 20 gallons of water with a wetting agent as described under chemicals, when the broad-leaved weeds are in the young, rapid-growth stage. Common weeds controlled with this treatment are:

Bitter sneezeweed (eastern bitterweed)	Nightshade (silverleaf)
Annual broomweed	Pigweed (carelessweed)
Bloodweed	Plantain
Cocklebur	Poorjo
Coneflower	Pricklepoppy
Croton (incl. goatweed)	Ragweed
Dock	Russianthistle
Eryngo	Senna
Eveningprimrose	Sesbania
Fleabane	Sneezeweed (eastern bitterweed)
Gaillardia	Snow-on-the-prairie
Goathead	Snow-on-the-mountain

Henbit
Horsemint
Mexicanweed
Mustards

Sowthistle
Sunflower
Thistle
Yankee weed

In low rainfall areas where growth conditions for weeds are poor and evaporation rates are high, 1 pound of low-volatile ester may be slightly more effective than the amine form.

The 1-pound rate of 2,4-D will kill most pasture legumes. An exception is whiteclover, which generally can tolerate up to 1 pound of 2,4-D with only slight damage. Where whiteclover is to be protected, use $\frac{1}{2}$ to $\frac{3}{4}$ pound of 2,4-D amine and omit the wetting agent, *or*, use $\frac{3}{4}$ pound of 2,4-D butyric, *or*, delay spraying until the clover has set enough hard seed to insure a volunteer stand the next fall. Where other pasture clovers, such as crimson, hop, Persian, and bur are present, spraying may be delayed until enough hard seed are present to insure a volunteer stand the next fall. Or, the first growth of weeds may be mowed and the regrowth sprayed.

Seedlings of perennial grasses may be sprayed with 2,4-D after they have four leaves. Stands for seed production should not be sprayed with 2,4-D between the boot and hard dough stages.

2. TEMPORARY SUMMER PASTURES AND HAY CROPS OF ANNUAL GRASSES

Use $\frac{1}{2}$ to $\frac{3}{4}$ pound of 2,4-D amine per acre in 15 to 20 gallons of water for broad-leaved weed control in plantings of Sudangrass, Perennial Sweet Sorgrass, Sorghum alnum, Johnsongrass, pearl millet and forage sorghums. Do not use a wetting agent because of the high summer temperature at the time of application. Delay spray application until these grasses are 4 to 6 inches high and spray when the broad-leaved weeds are in the young, rapid-growth stage.

3. TEMPORARY WINTER PASTURES OF ANNUAL GRASSES

Use $\frac{1}{2}$ pound of 2,4-D amine or low-volatile ester per acre in 15 to 20 gallons of water with a wetting agent. This treatment is suggested only to prevent weed-seed production or when weeds threaten to reduce forage yields. Delay spray applications until these grasses are well tillered, but treat the weeds when they are in the young, rapid-growth stage. If small grains are to be harvested for grain, do not use 2,4-D after they have reached the boot stage.

4. ALFALFA

Use $\frac{3}{4}$ pound of 2,4-D butyric per acre in 15 to 20 gallons of water with a wetting agent to control dock, henbit, mustard, and similar susceptible weeds. This treatment may be applied to established stands, or it may be used on seedling stands, provided the seedling alfalfa plants are well rooted and have five to seven trifoliolate leaves. Occasionally 2,4-D butyric will slow the growth rate on alfalfa, but the plants soon recover.

2,4-D amine may be used for the control of susceptible broad-leaved winter weeds, such as mustard, in dormant alfalfa stands. The rate suggested is $\frac{1}{2}$ to $\frac{3}{4}$ pounds per acre in 15 to 20 gallons of water with a wetting agent. Use of this mixture on growing alfalfa may damage the stand severely.

A substitute control for annual winter broad-leaved weeds, such as chickweed, henbit and mustard, is $2\frac{1}{2}$ to 3 quarts of selective dinitros per acre in 30 to 40 gallons of water. Do not use a wetting agent. Do not apply dinitros near the time alfalfa is to be grazed or cut.

For control of annual weedy grasses, such as crabgrass, sandbur and Coloradograss, use 5 to 7 pounds per acre of sodium TCA in 25 to 30 gallons of water. Do not use a wetting agent. Make the spray application when the weedy grasses are in the seedling stage and have no more than four leaves. Dalapon at the rate of 2 to 4 pounds per acre in 15 to 20 gallons of water may be substituted for the TCA treatment. The time of application should be the same as for TCA but use a wetting agent with the dalapon.

5. SPECIAL PROBLEMS

Bullnetties usually are controlled for most of the season with the 1-pound of 2,4-D amine-water mixture described on page 5, provided they are sprayed when they are growing rapidly and the plants are less than about 15 inches high. Individual treatment is required for control on older, tougher plants during mid-to-late summer. For individual plant treatment, use 8 pounds of amino triazole (50 percent wettable powder) in 100 gallons of water. Spray the plants thoroughly. This mixture should be applied carefully, since it will kill pasture grasses and legumes. See Note A.

Another treatment is to cut bullnettle plants at ground level and saturate the stumps and crowns with a solution of 3 pounds of ammate per gallon of water. This method requires much more labor than the treatment previously described.

Curly dock and *bull thistle* grow in fertile, moist areas where whiteclover and other better pasture legumes usually grow. Both may be controlled by broadcast spraying with $\frac{3}{4}$ pound of 2,4-D butyric per acre in 15 to 20 gallons of water with a wetting agent as described under chemicals. Dock must be sprayed before the plants send up seed stalks; bull thistle plants should be treated before blooms appear. The time for treatment will vary from late fall to early summer, depending on the area. This treatment will not permanently harm stands of alfalfa, whiteclover, hop clover or burclover. It should not be used on other legumes until further research proves it safe for such use.

Hoarhound is a troublesome weed in cultivated pastures and around barns and lots. Young, tender growth usually can be controlled with the 1-pound 2,4-D amine treatment described on page 5, but this treatment does not always give control. Young hoarhound growth may be controlled with 1 pound of 2,4-D low-volatile ester per acre in 20 to 25 gallons of water with a wetting

agent and applied as a broadcast spray or spot treatment. For old, tough hoarhound growth, use 1 pound of 2,4,5-T low-volatile ester in at least 25 gallons of water with a wetting agent and wet the foliage thoroughly.

Legumes, such as burclover, alfalfa and sweetclover, when present in grass stands, often cause bloating. Stands of these and other legumes may be thinned with 2,4-D to the point that the danger of bloat will be lessened or eliminated. Use $\frac{3}{4}$ to 1 pound of 2,4-D amine per acre in 15 to 20 gallons of water with a wetting agent and apply the solution as a broadcast spray when the plants are making rapid growth. If the legume stand is not reduced sufficiently, repeat the treatment. In some instances it will be desirable to eliminate stands of a legume prior to establishment of other plants. The same treatment is suggested for these cases.

Perennial grasses sometimes should be eliminated on cropland prior to the establishment of other pasture, hay or silage crops. Bermudagrass and Johnsongrass may be controlled with 10 pounds of dalapon per acre in 40 to 50 gallons of water with a wetting agent as described under chemicals. Apply the dalapon while the grass is growing and when Johnsongrass is less than 8 inches high. Follow this treatment in 10 to 14 days with tillage. Some retreatment of scattered surviving plants may be necessary. Wait 5 to 7 weeks before planting dalapon-treated areas. For spot treatment, use 1 pound of dalapon per 5 gallons of water and wet the leaves of the grass.

Precautions

Herbicides discussed in this leaflet are valuable tools for controlling weeds and their use need not be hazardous. However, considerable damage can result from careless use. The following precautions are suggested:

1. Study the State Herbicide Regulations, available from the Commissioner of Agriculture, Austin, Texas, to see how they may apply to you.

2. Use no more 2,4-D than suggested.

3. Use the amine form of 2,4-D, unless another form is specified.

4. Do not apply 2,4-D when wind velocity is more than 8 miles per hour.

5. Apply 2,4-D at 30 pounds pressure and use a nozzle that delivers a coarse spray.

6. Poor control likely will result from improper coverage or from spraying plants that are growing slowly.

7. Do not take a chance on damaging susceptible crops with 2,4-D.

8. Observe the manufacturers label directions for handling all herbicides.

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