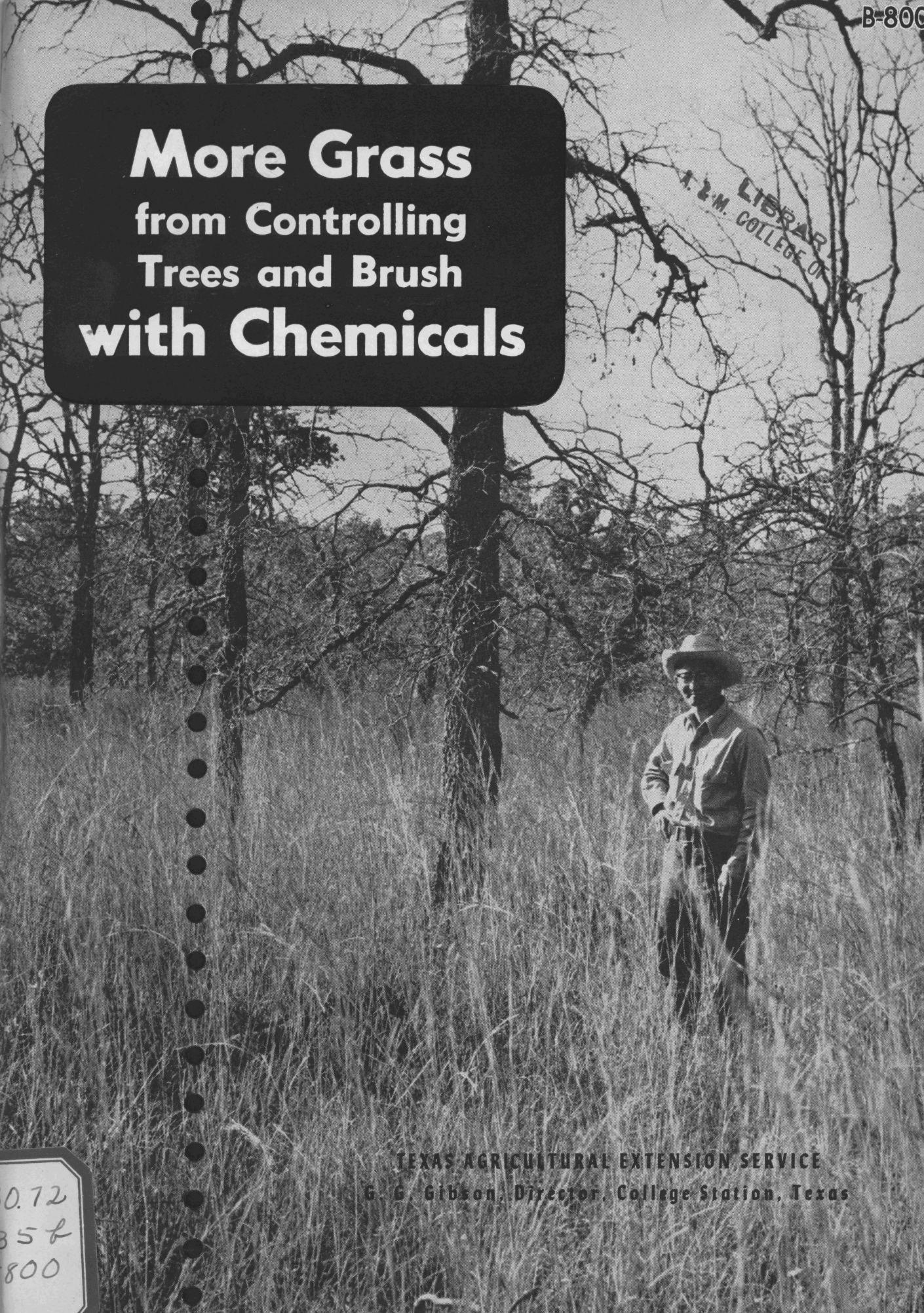


More Grass from Controlling Trees and Brush with Chemicals

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TEXAS AGRICULTURAL EXTENSION SERVICE
G. G. Gibson, Director, College Station, Texas

SUGGESTED TREATMENT AND CHEMICAL FOR VARIOUS SPECIES

HAND APPLICATION

Mixtures containing 2,4,5-T ester are based on 4 pounds acid per gallon.

Kind of Brush	Chemical and Mixture	Season	Method of Application
Ash, black gum, elm, sweet gum, sycamore, water oak	1 lb. 2,4,5-T in 6 gal. diesel oil or kerosene	Dec.-March May-August	Apply in frills at base of tree or on freshly cut stumps.
Blackjack oak, bur oak, post oak, red oak	1 lb. 2,4,5-T in 6 gal. diesel oil or kerosene	Dec.-March May-August	Apply to freshly cut stumps or trunk base of standing trees. On all trees over 6" thick make frills and treat.
Lote, mesquite	1 lb. 2,4,5-T in 10 gal. diesel oil or kerosene	Anytime	Apply to freshly cut stumps or trunk base of standing trees. On all trees over 6" thick make frills and treat.
Bois d'arc, bitter pecan, gum elastic, hackberry, honey locust, hornbeam, huisache, prickly ash, red haw, sassafras, sumac, wild china-berry, willow, yaupon	1 lb. 2,4,5-T in 12 gal. diesel oil or kerosene	Dec.-March May-August	Apply to freshly cut stumps or trunk base of standing trees. On all trees over 6" thick make frills and treat.
Live oak	1 lb. 2,4,5-T in 12 gal. diesel oil or kerosene	Dec.-March May-August	Apply on stumps, in frills or notches.
Pricklypear	1 lb. 2,4,5-T in 12 gal. diesel oil or kerosene	June-Sept.	Apply to both sides of leaves and base of plants.
Blackjack oak, hackberry, locust, post oak, red oak, sumac	Ammate crystals or 3 lb. in 1 gal. water	Fall and winter	Apply crystals to stumps or in cups. On big trees apply ammate solution in frills.
Eastern persimmon, sassafras	3 lb. Ammate in 1 gal. water	Spring or summer	Apply on cut-off stumps.
Huisache, mesquite	1 qt. or more kerosene or diesel oil per tree	Summer or winter	Apply during a dry time at ground line.

AERIAL APPLICATION

Mesquite	$\frac{1}{2}$ lb. 2,4,5-T or silvex with $\frac{1}{2}$ gal. diesel oil and enough water to make 3 gal. spray solution per acre	April-June	Apply 50-80 days after leaves first appear in spring under good growth conditions.
Post and blackjack oak	$1\frac{1}{2}$ lb. 2,4,5-T or silvex with 3 gal. water and enough oil to make 4 gal. spray solution per acre	April-June	Apply under good growth conditions. Another spraying 1 or 2 years later is probably advisable.

More Grass From Controlling Trees and Brush With Chemicals*

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Brush and weeds cause more production loss in Texas each year than soil erosion or all types of insects. Therefore, brush control is one of the biggest problems faced by the farmer and ranchman. Undesirable trees and brush use up water and minerals which should be used by forage growth for livestock production. Brush controlled areas have produced twice as much grass as untreated ones even under drouth conditions. This means more pounds of meat per acre.

Sometimes the brush infestation is so heavy that livestock handling is made difficult. Often this brush grows on some of the most productive land. In timber areas, hardwoods often hold back or crowd out desirable pine trees. Control of hardwoods to increase the quantity and quality of forage production, makes livestock handling easier and, in forest areas to release timber growth, is both practical and profitable. Control of hardwoods without following range management practices such as proper stocking, deferred and rotation grazing and in some cases, reseeding and fertilization, will not result in permanent benefits to the pasture. Mechanical methods such as bulldozers, anchor chains, brush and weed cutters and root plows have a definite place in brush control and maintenance work. Often a combination of mechanical and chemical methods will give the best control per dollar spent. Operators should study their particular conditions to determine the most profitable methods to follow.

METHODS OF APPLICATION

Spray solutions may be applied to individual plants with a hand or back-type sprayer or broadcast using tractor equipment or airplanes.

*The recommendations given in this circular are based on research conducted by the Range and Forestry Department, the Texas Agricultural Experiment Station and trial demonstrations conducted by county agricultural agents.

Portable handsprayers are suitable for scattered individual foliage treatment on seedlings or small brush and for frill, trunk base and stump treatment. Tractor or jeep-drawn power spray equipment can be used on low growing brush or following mechanical control work. Aerial application provides economical and rapid coverage of large areas of moderate or heavy brush. Such broadcast methods have certain limitations, however. They must be applied when the brush is in full foliage, only give control of certain kinds of brush and should not be used in susceptible crop areas.

CHEMICALS USED

Chemicals used in brush control work may be selective, such as 2,4-D, 2,4,5-T, or silvex, or non-selective such as ammate, kerosene, or diesel oil. Selective herbicides are absorbed and transported within the sap stream of plants while non-selective chemicals kill primarily by contact.

2,4,5-T

This hormone-type herbicide shows much promise for brush control work. It is non-poisonous to man and livestock and will not kill grass at the rates given for controlling brush.

Caution:

This chemical may kill susceptible crops such as cotton, legumes, fruit trees and garden vegetables if sprayed in such a way that it drifts onto the foliage of these plants. Spraying should not be done when wind exceeds ten miles per hour. Sprayers used to apply herbicides can be used later to spray livestock provided the sprayers are properly cleaned. This same equipment should **not** be used to apply insecticides on crop plants, flowers or garden vegetables. 2,4-D, another hormone weed killer, is ten times more dangerous to cotton than 2,4,5-T. 2,4-D



Fig. 1

gives good control of most weeds but is not very effective on most types of woody growth.

The low volatile esters of 2,4,5-T or silvex which give off less fumes following spraying are recommended. The sale and use of these chemicals is regulated by the Texas Herbicide Law which is administered by the State Commissioner of Agriculture. Before using materials like 2,4,5-T, be sure you are complying with the law.

Mixing solutions: 2,4,5-T should be mixed with diesel oil, kerosene or water depending on the kind of treatment to be used. The amount of active ingredients expressed as acid equivalent is stated on the label in pounds per gallon. Most commercial products contain **4 pounds** of active acid per gallon and the **following recommendations are based on this amount.**

Strengths of herbicide solutions are usually expressed as percent acid or as pounds of acid per volume of spray solution. To make a 1% solution in diesel oil or kerosene, mix 4 pounds of 2,4,5-T in 50 gallons of oil. For making small quantities, mix $\frac{1}{3}$ measuring cup of 2,4,5-T in 1 gallon of oil.

To make a 2% solution, double the amount of 2,4,5-T or halve the amount of oil. For example, mix 1 gallon of 2,4,5-T in 25 gallons of oil or $\frac{2}{3}$ cup in 1 gallon of oil.

Foliage applications usually vary from .2% to .5% solutions and are mixed with water as



Fig. 2

the carrier. A small amount of oil (up to 5 gallons per 100 gallons of solution or a cup of soap powder per 100 gallons) may be added to make the solution stick better on the leaves. Mix 1 pound (1 quart) 2,4,5-T in 62 gallons of water or 1 tablespoonful in 1 gallon of water for a .2% solution; or mix 1 pound (1 quart) 2,4,5-T in 25 gallons of water or $2\frac{1}{2}$ tablespoonfuls in 1 gallon of water for a .5% solution. Such solutions should be applied to the leaves and stems of plants after full leaf growth under good moisture conditions. Hand or cattle sprayers may be used. Thorough coverage is necessary. Foliage sprays are most economical on brush under 6 feet high. Pressure less than 40 pounds is advised since large drops give better results and there is less drift hazard.

Methods of Treatment

2,4,5-T may be applied to cut-off stumps, on the trunk base, in overlapping ax cuts (frills) or on the foliage.

Stump: Spray the cut-off stumps with a 2,4,5-T solution in oil as shown in Figure 1. Care should be taken that the cut surface as well as the sides of the stump are sprayed thoroughly (Figure 2). Stump treatment gives the highest percentage kill of trees with no sprouts, but more labor is needed to cut off the trees. Areas to be converted into planted or mowed pastures, in fence rows and around corals and pens are adapted to stump treatment. Figure 3 shows a post oak stump cut and treated

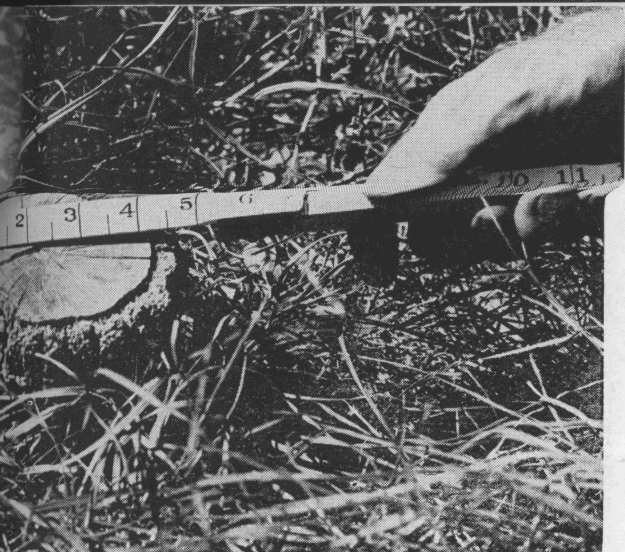


Fig. 3



Fig. 4

with a 2% solution of 2,4,5-T in diesel oil (16 pounds of 2,4,5-T acid in 100 gallons of oil) two years before. For best results, stumps should be treated right after the tops are removed. A gallon of solution should treat 40 4-inch stumps.

Trunk base: Spray the trunks of trees all the way around from ground level up 12 inches high as shown in Figure 4. Let the solution run down to the ground and around the crown. Trunk-base spraying takes more chemical solution than stump treatment as 1 gallon will only treat about 25 4-inch trees, but there is much less labor involved. This method works well on certain kinds of trees less than 6 inches thick. Figure 5 shows results of trunk-base treatment on post oak. A 2% solution of 2,4,5-T was applied to these trees two years before.

Frill: A frill consists of overlapping downward ax strokes with cuts made about $\frac{1}{2}$ inch deep into the wood all the way around the trees. The spray solution is applied into this cut as shown in Figures 6 and 7. The closer these cuts are made to the ground the better the results will be. This method of treatment requires more labor than the trunk-base method, but the amount of chemical saved will more than offset this additional cost. A gallon of spray solution applied in frills should treat 25 10-inch trees. Present research shows that the frill method of treatment is advisable on all kinds of trees over 6 inches thick.

Foliage: Spraying the foliage as shown in Figure 8 will control various kinds of brush on

small areas. Mesquite can be controlled with 2 pounds 2,4,5-T or silvex in 100 gallons of water; oak with 3 pounds 2,4,5-T or silvex in 100 gallons of water; and McCartney rose with 1 pound 2,4,5-T in 100 gallons of water. Often repeat treatments are necessary as sprout growth is harder to control than mature trees. Note that 2,4,5-T or silvex is usually mixed with water for foliage application. If straight oil is the carrier, plants often are defoliated but not killed since the oil burns off the leaves before the full effect of the chemical is translocated into the stems, trunks and roots.

AMMATE

Ammate or ammonium sulfamate is a yellow, sugar-like chemical which has a place in brush

Fig. 5





Fig. 6



Fig. 7

Fig. 8



Fig. 9

control work. It, too, is nonpoisonous to man and livestock. This compound can be used adjacent to any crops without harming them unless sprayed directly on them; therefore, its use is often advised for killing trees around the home. Ammate can also be used as a grass and weed killer but may render the soil sterile for several months following treatment, depending upon moisture conditions. It is corrosive to metal, spray guns and buckets. Such equipment should be thoroughly washed following use and given a light coating of oil. Ammate should be kept in closed containers as it absorbs water from the air.

Ammate may be used as crystals on cut-off stumps, in V-notches on small trees and in cups, or mixed with water and applied in frills or on the foliage. Generally, 2,4,5-T solutions have given quicker, better and cheaper control than Ammate but some prefer Ammate because there is no drift hazard and less skill is required to mix solutions. Fall and winter treatment usually gives the best control.

Methods of Treatment

Stump: Ammate crystals may be applied directly to freshly-cut stumps as shown in Figure 9. For each 2 inches in diameter apply 1 tablespoon of Ammate to the outer inch of the stump. A soapy detergent plus a little water may be added to the Ammate crystals so they will stick on better.

Small trees may be cut down with two good strokes of the ax and 1 tablespoon of Ammate





Fig. 10



Fig. 11

crystals applied in the V-notch as shown in Figure 10.

Cup: Ammate can be applied in a cup, 1 tablespoon per cup, as shown in Figure 11. A cup is made by taking two downward ax strokes—one above the other—and prying out the chip. Make these cups as close to the ground as possible and spaced not over 4 inches apart on the main trunk.

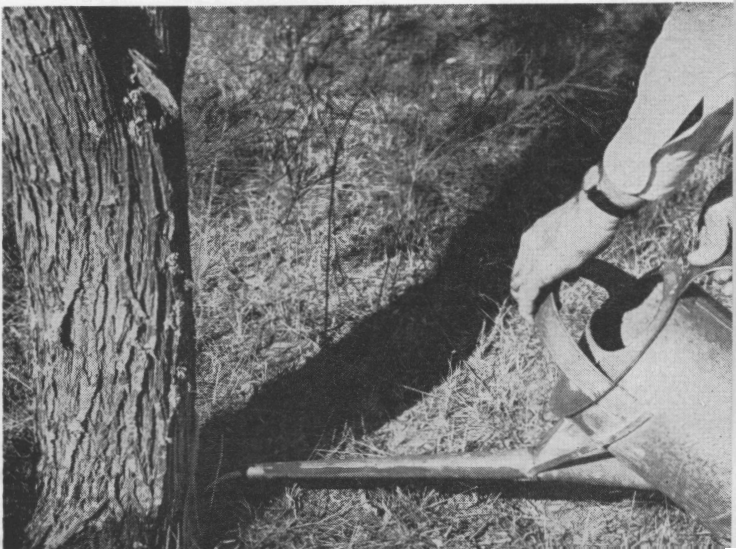
Frill: Ammate may be dissolved in water and applied in frills as shown in Figure 12. Frills consist of overlapping downward ax strokes all the way around the trees. Frill treatment gives good results on trees 10 inches thick and larger and is cheaper than the cup method of treatment. Mix 2 to 4 pounds of Ammate in 1 gallon of water.



Fig. 12

Fig. 13

Foliage: Ammate dissolved in water and sprayed on foliage of low growing brush gives good control. Air-blast machines have given better results than hydraulic sprayers. Such equipment should never be used for 2,4,5-T treatment as there is too much drift hazard. Pressures of 100 pounds or less are most desirable. The leaves, stems and twigs of all plants should be covered when plants reach full leaf and are growing actively. Foliage treatment is adapted to small spot spraying on the farm or on right-of-ways as the cost is usually prohibitive for large areas. Mix $\frac{3}{4}$ to 1 pound of Ammate per gallon of water for foliage application. From 50 to 200 gallons of spray material



per acre may be required to obtain good coverage. The addition of spreader stickers to the solution gives better results.

OILS

Kerosene and diesel oil have been commonly used for controlling mesquite and sometimes huisache. The underground buds on the root must be contacted with the oil in order to kill them; otherwise much sprouting results. This may take a quart of oil or more on large trees. Palmettos have also been successfully killed

with diesel oil or kerosene applied directly in each bud. As a carrier for 2,4,5-T solutions, diesel oil is preferred over kerosene. It is usually cheaper per gallon and, being oilier, gives more effective results.

Methods of Treatment

Apply the oil at the ground line as shown in Figure 13 for controlling mesquite and huisache. Use sufficient oil to soak down and kill the underground buds. Apply during a dry time. Summer or winter treatment gives best results.

RESEARCH IN PROGRESS

Additional chemicals and methods of application are being tested by the Texas Agricultural Experiment Station and tried in field demonstrations conducted by the Extension Service. These include CMU (Karmex) in powder and pellet form. CMU is a soil sterilant which may kill all types of vegetation for a certain period depending upon moisture conditions and the rate applied. It is being tested as a basal spray treatment mixed in water. The pellet form is being used on individual trees and in broadcast methods.

The hormone herbicides, 2,4,D, 2,4,5-T and

silvex, are being mixed with oil and injected into the soil at the base of trees with promising results. Also injection of herbicides into the trunk base of trees is being tested. The search is continuous for cheaper and more effective chemicals for brush and undesirable hardwood control. More effective methods of application requiring less labor and expense are needed. As research points the way, farmers and ranchmen will be given the information to help guide them in brush control for increased forage production and greater efficiency of livestock production.

Other Publications on Brush Control Available from Your County Agricultural Agent

L-127 Rev. Chemical Control of Mesquite

L-210 Dangers in the Use of Hormone-type Weed and Brush Killers

B-806 Pricklypear—Good or Bad?

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