DITCHBANK WEED CONTROL

in Washington

Weeds cost more than any other agricultural pest

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Ditchbank Weed Control in Washington

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Washington has thousands of miles of irrigation and drainage ditchbanks. Many of these ditchbanks have become infested with weeds. The spread of these weeds to adjoining lands is a constant threat. With the expansion and completion of the Columbia Basin Project, hundreds of miles of ditchbanks will be added. Unless properly handled, these ditchbanks may also become sources of weed seed for the newly irrigated areas.

Water Carries Weed Seeds

Ditchbanks are not the only source of weed seed. When ditchbanks become infested with weeds, the irrigation water may carry and spread the seeds.

Many weed seeds are buoyant enough to float and be carried long distances in running water. Debris collected from an irrigation ditch in one section of Washington...
Bull Thistle  
*Cirsium vulgare*

Hoe or grub.
Mow during the bloom stage.
Apply 1 or 2 pounds of 2,4-D per acre during the rosette stage or anytime before the bloom stage. Re-treat as necessary.

Canada Thistle  
*Cirsium arvense*

Hoe every 2 or 3 weeks. About two seasons required for eradication.
Apply two pounds of 2,4-D per acre applied at early bud stage in the spring. Re-treat growth in the fall. Apply two treatments per year for from 2 to 5 years.
Use soil sterilants.

Cheatgrass  
*Bromus Sp.*

Hoe, mow, or burn. Apply endothal at 6 pounds per acre in late fall or early winter. Apply dalapon at 5 to 7 pounds per acre in early spring. Apply amino triazole or weedicid at 2 to 4 pounds per acre after cheatgrass starts growing in early spring. Thoroughly wet cheatgrass with special weed-killing oils or other contact herbicides when lush, spring growth begins.
contained 4 per cent weed seeds by weight. Seeds of more than 30 different species of weeds were found. These ranged from the most widespread perennial noxious weeds in the state to poisonous and common annual weeds. Seeds of weeds such as morning glory and Canada thistle were found. Seeds of poisonous water hemlock were most common. Water hemlock is not a serious problem on cultivated lands, but is a dangerous threat to grazing livestock. Effective screens in irrigation systems prevent spread of weed seeds.

**Weed Seeds Stay Alive in Water**

Some seeds of many weed pests will sprout after they have been in irrigation water from several months to five years or more, according to research at the Irrigation Experiment Station, Prosser. Irrigation water generally does not destroy seeds of the more widespread weeds. Most of the seeds that sprouted kept alive long enough to have become established along the ditchbanks or on the irrigated land under favorable conditions.

**Prevention and Control**

Weedy fields next to irrigation systems are common sources of weed seed for ditchbanks. The vicious cycle of weeds on ditchbanks to fields and back cannot be stopped easily without full community cooperation and action. Every individual in the problem area should be concerned with weed prevention and control.

**Grasses**

Some type of plant usually develops on bare soil. Unless grasses are planted immediately, the first plants on new ditchbanks are usually undesirable and unsightly weeds.

In spite of the usual unfavorable soil and drought conditions on many ditchbanks, some grasses may be established. When properly handled, they compete well with weeds and tend to keep ditchbanks nearly weed-free, particularly if additional means of weed control are used.

The best adapted grasses and means of handling vary from one area to another. Short grasses are best.
China Lettuce
*Lactuca seriola*
Hoe, mow, or burn.
Apply ½ to 1 pound of 2,4-D per acre while plants are young and growing vigorously.
Dinitro compounds, special weed-killing oils, and other contact herbicides may be used also.

Curly Dock
*Rumex crispus*
Hoe or grub.
Close-clip or mow systematically before seed is formed.
Curly dock is somewhat resistant to 2,4-D. If used, 2,4-D should be applied at rate of 3 pounds per acre as early as possible. Important to spray before seed stalks form.

Green Foxtail
*Setaria Viridis*
Hoe, mow, or burn. Dinitro compounds, special weed-killing oils, and other contact herbicides may also be used. Most effective during early stages of growth. Use dalapon at 10 to 20 pounds or amino triazole or weedazol at 4 to 8 pounds per acre when plants are young and growing virgorously. The same applies for YELLOW FOXTAIL.
With most kinds of grass, 2 or 3 years usually are required to establish a suitable and fully effective grass cover. However, even scattered clumps of certain grasses tend to compete appreciably with weeds, especially on dry ditchbanks.

**Pasturing**

Pasturing of ditchbanks is desirable and economical unless soil type, design or structure of the irrigation system prevents it. Moderate grazing by livestock tends to control weeds and also makes use of the grass cover. Certain species of grasses, when not grazed or checked by other means, may grow too rank, droop into the channel, and retard the water flow.

**Mowing**

Mowing may control weeds on ditchbanks where grazing by livestock is not practical. Timely mowing tends to control weeds and to encourage and regulate the development of grasses. To do this, ditchbanks must be easy to get to and planned for mowing machines.

**Burning**

Different kinds of weed burners may be used to control weeds. These range from small, knapsack-type kerosene burners to large, spray-type power burners mounted on trucks or trailers.

One method of burning to control weeds on ditchbanks only sears the plants during the first operation. Searing causes most of the plants to wilt and die slowly, usually within 1 or 2 days. This makes dry material for a second, thorough burning within 10 days or 2 weeks. Timely burning checks the growth of weeds, especially annual weeds, while allowing the development of perennial grasses.

**Hoeing and Grubbing**

Small patches or occasional scattered plants of perennial- or biennial-type weeds may be eliminated by hoeing or grubbing. Perennial weeds that spread by underground root systems should be hoed to a depth of 1 or 2 inches every 2 or 3 weeks until they no longer grow again. This may take from one to three seasons.

Grubbing usually is done only to biennial and short-lived or special perennial weeds without underground creeping type of root systems. These plants should be grubbed deep enough to remove the crowns or propagating portions. Grubbing so much that the ditchbank is seriously weakened or damaged should be avoided.
Jim Hill Mustard
*Sisymbrium altissimum*

Hoe, mow, or burn.
Apply ½ to 1 pound of 2,4-D per acre during the early stages of growth.
Dinitro compounds, special weed-killing oils, and other contact herbicides may be used also, particularly during early stages of growth.

Lamb's Quarters
*Chenopodium album*

Hoe, mow, or burn.
Use ½ to 1 pound of 2,4-D per acre.
Add spreader-sticker or dispersing agent to spray mixture. Apply while plants are young and growing vigorously.
Dinitro compounds, special weed-killing oils, and other contact herbicides also may be used.

Mallow
*Malva neglecta*

Hoe, grub, or pull.
Make repeated applications of 2 to 4 pounds of 2,4-D per acre or 3 to 6 teaspoonsfuls of 2,4-D per gallon of water. Apply while plants are in the early growth stages.
Chemicals

On many ditchbanks, especially in the older irrigated areas, weed growth must be controlled before grasses can be established. Three different classes of weed-killing chemicals may be used to control such weed growth. These are selective herbicides, general contacts and soil sterilants. The killing action of each is somewhat different and specific in nature. The class of chemical used depends on the particular situation and the kind of weeds.

Selective Herbicides

A chemical such as 2,4-D is a selective weed killer. The only forms of 2,4-D now recommended for weed control on ditchbanks are the amine, low-volatile ester, and emulsifiable acid. The high-volatile esters of 2,4-D may be equally effective on weeds but often are a greater hazard to nearby crop plants. Because of the wide variety of crops in irrigated areas, the type of 2,4-D, time of spraying, wind speed, and other factors must be considered to prevent injury to crops affected by 2,4-D.

The use of 2,4-D has a distinct advantage. At recommended dosages, 2,4-D kills many undesirable broad-leaved weeds without much injury to grasses.

Application of 2,4-D at the right stage of weed development is essential for best control. How often it is applied depends on the type and growth of weeds to be controlled. Climate and soil moisture may indirectly influence the effectiveness of 2,4-D.

Weeds growing on the tops and shoulders of dry ditchbanks may be less affected by 2,4-D than those growing vigorously where there is more moisture in the soil. The susceptibility of weeds to 2,4-D may vary also with the species. Therefore, weeds should be identified before spraying. Adding spreader-sticker or dispersing agent to the spray mixture helps, especially in treating "hard-to-kill" weeds.

Non-selective Herbicides

General Contacts

Among the general contact sprays that kill the top-growth of perennial weeds as well as annual weeds are the special weed-killing oils and dinitro compounds. Because perennial weeds usually recover and produce new top-growth soon after application of a contact spray, these chemicals are used mainly for the control of annual weeds. When using these materials, follow the manufacturer's recommendations. As a general rule, enough
**Mare's Tail**

*Erigeron canadensis*

- Hoe, mow, or burn.
- Apply 2 pounds of 2,4-D per acre or 4 teaspoonfuls of 2,4-D per gallon of water while plants are young and growing vigorously.
- Dinitro compounds, special weed-killing oils, and other contact herbicides also may be used.

**Marsh Elder**

*Iva xanthifolia*

- Hoe, mow, or burn.
- Apply 1 pound of 2,4-D per acre or 2 teaspoonfuls per gallon of water while plants are small and growing rapidly.
- Dinitro products, special weed-killing oils, fuel oils, and other contact sprays may be used also when plants are small.

**Morning Glory**

*Convolvulus arvensis*

- Hoe every 2 or 3 weeks. Two or three seasons required for eradication.
- Apply 1 to 2 pounds of 2,4-D per acre at early bud stage in the spring. Retreat growth in the fall. Apply two treatments per year for from 2 to 5 years.
- Use soil sterilants.
Contact spray should be applied to cover all the foliage thoroughly.

Contact sprays usually are most effective on young plants. Seedling weeds have been controlled effectively with a mixture of one quart of dinitro (4,6-dinitro-ortho secondary butylphenol) plus 10 or 20 gallons of diesel oil plus an oil-water emulsifier in 100 gallons of water per acre. As weed growth advances the oil content of the mixture may be increased correspondingly up to as much as 50 gallons.

Special weed-killing oils generally are applied undiluted in sufficient quantity to wet the foliage. In most cases it is not necessary to add other material to this oil.

Several applications during the season may be needed to control weeds with any of the general contact herbicides.

**Soil Sterilants**

Several different soil sterilants may be used on ditchbanks to control weeds, particularly noxious perennials. Among these are the chlorate, borate, and urea compounds. The chlorate and borate compounds separately or in combination generally have been most effective for deep-rooted perennial weeds such as Canada thistle, Russian knapweed, and morning glory.

White top is resistant to these soil sterilants and two or three times the rate used for other perennials must be applied for effective control. In preliminary trials the borate plus 2,4-D mixture has shown promise under certain conditions.

Urea compounds monuron and diuron (CMU or Karmex W or Karmex DW) at rates from 25 to 35 pounds per acre have proven particularly effective in controlling quackgrass and other shallow-rooted weeds. Their use in controlling deep-rooted perennials has not been fully tested.

Commercial soil sterilants may vary in chemical composition. County Extension agents can help in selecting the most suitable product and rate of application for particular situations.

Soil sterilants generally should be applied in the fall (late September through October) so that late fall and winter rain and snow may leach the chemicals uniformly into the root zone of the weeds. Without enough moisture to leach the chemicals into the root zone, soil sterilants may fail to control deep-rooted perennial weeds and may fail to prevent seed production.

On the other hand, soil sterilants, especially the soluble types, may not control deep-rooted perennial weeds
**Perennial Sowthistle**
*Sonchus arvensis*

Hoe every 2 or 3 weeks until eradicated. Apply 2 pounds of 2,4-D per acre or 4 teaspoonfuls per gallon of water at the pre-bud or early bud stage of growth. Re-treat as necessary to complete eradication. Use soil sterilants.

**Pigweed**
*Amaranthus Sp.*

Hoe, mow, or burn. Apply 1 pound of 2,4-D per acre or 2 teaspoonfuls of 2,4-D per gallon of water during the early growth stages. Dinitro products, special weed-killing oils, fuel oils, and other contact herbicides are also satisfactory.

**Poverty Weed**
*Iva auxillaris*

Hoe every two or three weeks until eradicated. Apply 2 pounds of 2,4-D per acre or 4 teaspoonfuls per gallon of water. Add spreader-sticker or dispersing agent. Apply during the active growth pre-bud stage. Re-treat as necessary.
where soils are moist, such as near the water line. In many situations, using 2,4-D near the water line may control broadleaved weeds without destroying desirable grassy vegetation. Soil sterilants should not be used where destroying plants, leaving the soil bare and breaking down the soil structure would cause too much erosion.

Once the chemical is leached into the soil, irrigation water will not usually move it to fields unless the soil actually containing the chemical erodes. Chlorates, particularly, may be poisonous to livestock. They should be leached well into the soil before livestock are allowed into treated areas.

Because these chemicals tend to sterilize the soil for several years, establishing grasses on treated areas is difficult. Therefore, it is wise to limit their use on ditchbanks to small patches of the noxious perennial weeds.

Often one application of a soil sterilant does not completely control deep-rooted perennial weeds. Examine treated areas from time to time and re-treat surviving plants the following fall. Usually survival is limited to a few scattered plants that may be re-treated individually.

DPA or Dalapon (commercially available as 85% sodium salt of 2,2-dichloropropionic acid) and ATA (commercially available as 50% 3-amino-1,2,4-triazole under the trade name of Amino Triazole and Weedazol) belong to a newer class of chemicals. Within grass-type plants, these chemicals apparently are moved from the leaves to the roots and act as systemic herbicides. These chemicals have not been investigated fully, but enough information is at hand to justify trial use.

Reminders

Avoid contamination of the irrigation water when applying weed-killing compounds on the ditchbanks. Spray upstream, not downstream. This lessens the danger of large amounts of chemical building up in the water from accidental or unavoidable spraying into the stream.

Weed-killers are plant killers! Use them safely. County Extension agents have information on how and when to use herbicides to avoid damage to crops.

Chemical formulations may change from one season to the next. Notice information in the manufacturer’s label.

Weed seeds deposited in the soil may cause reinfestation. Check treated areas frequently and destroy weed seedlings. The establishment of a good grass cover will help control weed seedlings.
Puncture Vine
*Tribulus terrestris*

Begin treatment *before* seed pods form.
Hoe, pull, or burn.
Apply 1 pound of 2,4-D per acre or 2 teaspoonfuls of 2,4-D per gallon of water during the early stages of growth.
Dinitro products, special weed-killing oils, fuel oils, and other contact herbicides are satisfactory also.

Quackgrass
*Agropyron repens*

Hoe every 2 weeks for one season or more.
Apply 1 pound of TCA in 1 gallon of water per square rod, in the fall. Complete eradication by hoeing regrowth, which is likely to occur during late spring and early summer the following season.
Use soil sterilants.

Russian Knapweed
*Centaurea repens*

Hoe every 2 or 3 weeks until eradicated (from one to three seasons).
Four pounds per acre of some emulsifiable acids or low-volatile esters of 2,4-D have shown some promise.
Apply during the early bud stage in the spring and re-treat in the fall. Repeated treatments over several years may be necessary.
Use soil sterilants.
Hoe, pull, or burn. Apply 1 pound of 2,4-D per acre while plants are tender and succulent (1 to 4 inches tall).
Use special weed-killing oils, dinitro-diesel oil-water emulsion, and other contact sprays while plants are young.

Begin treatment before seed heads have formed. Hoe, pull, or burn. Apply 1 quart of dinitro general plus 35 to 50 gallons of diesel oil plus an oil-water emulsifier in 100 gallons of water per acre. Special weed-killing oils and other contact sprays are also effective. Use dalapon at 20 to 25 pounds per acre or amino triazole or weedazol at 8 to 10 pounds per acre.

Grub and destroy basal portion and roots.
Apply 2 pounds of 2,4-D per acre or 4 teaspoonfuls of 2,4-D per gallon of water. Completely cover the plant with the spray before bloom stage. Re-treat as necessary.
Wild Barley
*Hordeum jubatum*

Usually grows in subby or saline areas. Overgrazing and other disturbances may encourage infestation. Correct contributing factors and provide competition with desirable grasses. Hoe or grub. Mow or burn to prevent seed production. Use dalapon at 20 to 30 pounds or amino triazole or weedazol at 8 to 12 pounds per acre when plants are young and growing vigorously.

Wild Salsify
*Tragopogon Sp.*

Hoe or grub.
Apply 1 or 2 pounds of 2,4-D per acre during the early stages of growth.

White Top
*Cardaria draba*

Hoe every 2 or 3 weeks. At least two seasons required to eradicate.
Apply 2 pounds of 2,4-D per acre at the early bud stage. If regrowth present, re-treat in the fall. Repeated treatments for several years may be necessary to eliminate.
Use soil sterilants.
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