

Principles of Weed Control

Classification of Weeds---Methods for each class

By Prof. John Bracken



Prof. Bracken
of the Saskatchewan University, Saskatoon, Sask.

Weeds are plants which interfere with the growth of crops or lower the profits of farming or mar the appearance of the landscape. It has been estimated that the weed crop of Saskatchewan costs her farmers \$30,000,000 a year and it is probably that the cost is relatively as great for the cropped areas in Alberta and even greater for the cultivated areas of Manitoba.

Weeds are harmful because:—(1) They dissipate soil moisture (approximately 500 pounds per pound of dry matter); (2) they use up plant food that otherwise might go to the production of crops; (3) they lower the yield of crops by crowding, shading and by using the water and plant food; (4) they lower the quality of grain causing it to go "rejected" thereby lowering the price; (5) they increase the cost of tillage, twine, shelling, threshing and freight; (6) they lower the value of the farm and (7) some weeds are poisonous.

The problem of weed control may be subdivided into three parts:—Prevention, the problem of the man who has none; eradication, the problem of the man who has only a few; and control, the problem of the man who has many.

Before attempting the solution of any of these it is well that men should know: (1) the appearance of the noxious weeds and their seeds; (2) the duration and habits of growth of the common weeds and how each spreads; and (3) the most successful methods of combating each type of weed.

Weed Bulletins to Consult

For information concerning the identification of weeds and weed seeds readers should consult one or more of the following bulletins:—

Farm Weeds—Clark, Dominion Department of Agriculture, Ottawa.

Better Farming—Bulletin No. 31, Saskatchewan Department of Agriculture, Regina.

Plants Injurious to Stock—Bulletin No. 7, Department of Agriculture, Regina.

Weeds used in Medicine—Farmers Bulletin No. 188, U. S. Department of Agriculture, Washington.

Weed Seeds—Bulletin No. 16, New Series, Dominion Department of Agriculture, Ottawa.

Noxious Weeds and How to Destroy Them—Department of Agriculture, Winnipeg, Man.

Weeds of Alberta—Alberta Department of Agriculture, Edmonton.

The Control of Sow Thistle in Manitoba—Manitoba Department of Agriculture, Winnipeg.

Duration of the Growth of Weeds

The normal life of the different classes of weeds is one year, two years or three years or more. Thus we have annual, biennial and perennial weeds, each type requiring a different treatment for its control or eradication. In the accompanying table our common weeds are grouped according to this classification, to which an intermediate group "Winter Annuals" has been added. This class includes annuals which start in the fall and are sufficiently hardy to live over winter.

Habit of Root Growth of Weeds

In addition to knowing the duration of growth of weeds, it is essential also to know the habit of root growth of each, because on this point depends very largely the nature of the means of eradication. There are three more or less distinct forms of roots: Fibrous roots; tap roots and the so-called creeping roots.

Annual weeds usually have fibrous or tap roots, biennial generally have tap roots while of perennial weeds many have fibrous, tap or creeping roots. Typical weeds of each of these types are:—Annual fibrous rooted (wild oats); annual tap rooted (lamb's quarters and most mustards); biennial tap rooted (tansy mustard and blue burr); perennial fibrous rooted (wild barley); perennial tap rooted (curled dock) and perennial creeping rooted (Canada thistle, sow thistle, quack grass).

The creeping rooted perennials are the most difficult to kill because of the fact that, unlike most other weeds, each joint of the roots may send up new plants even after the parent has been ploughed down.

How Weeds Spread

Man is the chief agency in the spread of weeds, but nature also aids in their dissemination. Among the influences by which man aids weed distribution are:—Importing weedy foodstuffs including hay; sowing impure seed; neglecting road

allowances and railway rights of way and freight yards; the use of undecayed farmyard manure; custom threshing and tillage machinery.

Among the natural agencies resulting in the distribution of weeds are:—

1. Wind blowing—(a) fluffy or hairy seeds such as dandelion, Canada thistle and sow thistle; (b) winged seeds such as dock and parsnip; (c) seeds having extended edges such as penny cress; (d) plants that roll as Russian thistle and tumbling mustard; (e) sticky seeds, which while wet adhere to weeds and blow with them, as plaitain; (f) weed infested soils.

2. Water in irrigation—flood streams and rapid run off water.

3. Animals—barbed seeds attach themselves to

THE CHIEF CLASSES OF WEEDS

Annual Weeds

*Wild Oats. *Stinkweed. *Wild Mustard. *Hares Ear Mustard. *Tumbling Mustard. *Ball Mustard. *False Flax. *Russian Thistle. *Purple Cockle. *Cow Cockle. *Ragweed. *Bird Rape. *Blue Burr. *Night Flowering Catchfly. *Wormseed Mustard. *Shepherd's Purse. Wild Buckwheat. Lamb's Quarters. Spear Leaved Goosefoot. Darnel. Red Root. *Dodder.

Winter Annuals

*Stinkweed. *Hares Ear Mustard. *Tumbling Mustard (sometimes). *Ball Mustard. *False Flax. Blue Burr. *Night Flowering Catchfly. Wormseed Mustard. Tansy Mustard.

Biennials

*Blue Burr. Wormseed Mustard. Tansy Mustard. Small Wallflower.

Perennials

*Canadian Thistle. *Perennial Sow Thistle. Quack Grass. Blue Lettuce. Loco Weed. White Stemmed English Primrose. Water Hemlock. Sweet Grass. *Curled Dock. Poverty Weed.

Those weeds indicated by † are classed as "noxious" by the Saskatchewan Department of Agriculture, while those indicated by * are classed as "noxious" by the Dominion Department of Agriculture.

animals and are thus distributed. Examples are burdock and blue burr. Sticky seeds such as mistletoe, and meadow saffron are distributed in the same way. In undecayed manure many undigested seeds are spread around.

4. Birds—attached to dirt on feet.

General Principles of Weed Control

The two fundamental principles of weed control are:—(a) To prevent seed distribution and (b) to kill the weeds and seeds already in the land.

Seed distribution can only be prevented by:—(1) not sowing weed seeds, (2) not letting any weeds go to seed, (3) cleaning to separator that comes to a man from his neighbors' dirty farm, (4) keeping stray animals off the place, (5) preventing, as far as possible, the drifting of the soil, (6) not using feeds containing viable weed seeds.

The weeds and seeds already in the land can be killed only by:—(1) Encouraging the seeds to germinate and then killing the young plants, (2) Plowing perennials in dry time, (3) Plowing or discing or cultivating thoroughly in the fall for winter annuals and biennials.

Annual weeds can be controlled by:—(1) Not sowing them. In other words by sowing clean seed. (2) Preventing the means of spreading, such as drifting soil, dirty threshers and wandering stock from a neighbor's dirty farm. (3) Preventing seed formation until such time as all seeds in the soil have germinated. This may be accomplished by following, using hoe crops, sowing annual pasture crops to be cut before weed seeds mature, sowing perennial hay crops which tend to prevent weed growth and which are cut before seeds mature, using early maturing crops such as early barley and winter rye, early fall cultivation to encourage germination of seeds and early spring cultivation to be followed by subsequent cultivation.

Biennial weeds can be controlled by following, using hoe crops and by giving particular attention to two other points, namely, the necessity of ploughing stubble ground every year either in fall or spring in order to kill the young biennials before seed formation and the necessity of late and thorough fall cultivation of the fallow with a duck-foot cultivator in order to kill any young biennials that may have started.

In the control of perennial weeds all three points mentioned for the control of annuals must be observed and in addition the following practices relating to the killing of plants already established in the soil should be kept in mind:—(1) Tap rooted perennial plants can be killed only by deep ploughing; (2) fibrous rooted perennial plants can be killed by plowing, followed by thorough cultivation; and (3) creeping rooted perennial plants can be killed by plowing in a dry time, plowing in spring and sowing a leafy crop and plowing shallow in fall and plowing again in late June followed by suitable surface cultivation.

To be more specific with regard to the last point perennial weeds such as quack grass can be controlled in breaking, stubble and fallow as follows:—In breaking—by plowing all the land and leaving no skips or misses, plowing shallow early in June and plowing again deep late in the summer, and, on less grassy land in more dry areas, and particularly in dry seasons, deep breaking followed by timely and sufficient surface cultivation may kill the native quack but seldom does the sweet grass so frequently found in low moist places.

In stubble—by plowing in fall, a "dry" time, and by plowing in spring and seeding at once to a leafy crop such as oats or barley.

In fallow—by plowing and digging out the roots with a spring tooth cultivator, always costly and not always an efficient method but sometimes advisable and necessary, and by plowing twice, preferably shallow in the fall when dry, and deep in the late June following.

The chief means at our disposal for controlling weeds already in the soil are tillage, crop rotations, smothering, hand pulling pasturing and chemical sprays.

Tillage to Control Weeds

In so far as controlling weeds is a function of following it is accomplished by tilling the latter in such a way as to germinate the weed seeds present and to kill the weeds that grow. The use of hoe or intertilled crops enables us to germinate seeds and to kill annual and biennial weeds without leaving the land idle. By plowing in fall or spring every year biennials can be controlled absolutely and perennials can at least be kept in check. By discing early in the fall annuals can be lessened and by thorough discing late in the fall biennials can be lessened but not entirely controlled.

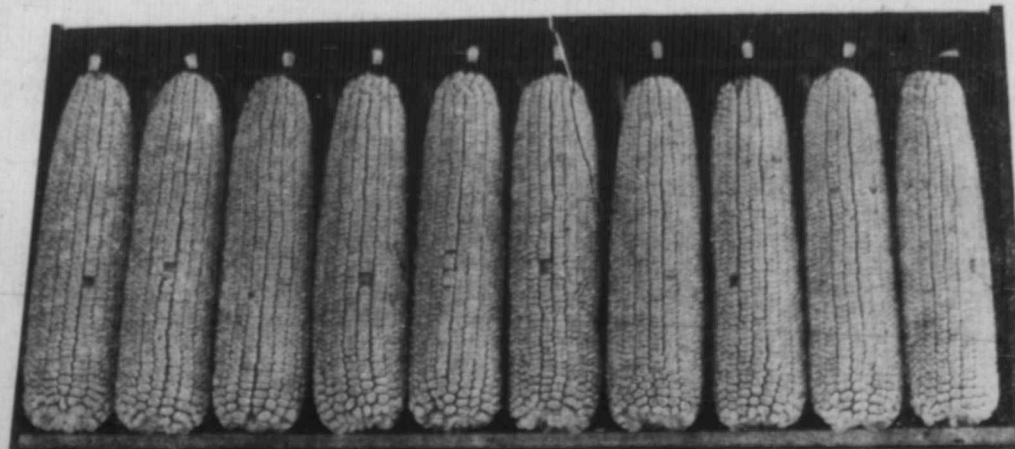
By using the duck-foot cultivator small weeds of all types can be killed. By harrowing, young weeds can often be lessened at a very low cost whether they appear in the fallow or in the growing crop.

Digging by hand is not a popular method of weed control but when Canada or sow thistle is first observed in small patches either may be "eradicated" by hand if the area is too small to cultivate with machinery.

Crop Rotations and Weed Control

If we had good crop rotations we could control our weeds at one-tenth the present cost. But there are several fundamental reasons why

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