

WEED CONTROL

in the Corn Crops of Southwestern Idaho

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Corn is a major crop in Southwestern Idaho. This area produces 95 percent of the nation's sweet corn seed. Grain, silage, and commercial sweet corn are also important crops.

Effective weed control is important to profitable production of these corn crops. The relatively weak and slow-growing inbred lines that are used to produce hybrid sweet corn seed are especially vulnerable to weeds. The diminutive inbreds are sometimes overtopped by pigweeds and barnyardgrass. Although hybrid field and sweet corn compete strongly with weeds that emerge after layby time, the crops can be damaged severely by weeds that emerge early in the season.

The University of Idaho Parma Branch Experiment Station has conducted research concerning the control of weeds in corn. Studies during the past five years evaluated the effect of herbicides on weeds, on corn, and on the herbicide's persistence in the soil. The research also has been concerned with the effects of timing and methods of herbicide application.

TIMING AND METHODS

The studies consistently showed that early weed control is important. Early-emerging weeds that remained in the corn until the plants were seven inches tall caused a significant yield reduction. For this reason, pre-emergence herbicide treatments were most effective. However, post-emergence treatments were useful as a supplement in providing additional control of broadleaf weeds.

Pre-irrigation followed by cultivation and the preparation of a fine, firm seedbed increased the effectiveness of pre-emergence treatments. Soil incorporation was essential for the maximum benefit from all pre-emergence herbicides.

On the basis of 1970 prices, an effective rate of the pre-emergence herbicides suitable for use in corn ranged from \$9 to \$12 per acre on a broadcast treatment basis. Thus, from an economic standpoint, 12-inch band treatment over the rows with cultivation of the middles is most desirable.

Early timing was the most essential element with post-emergence treatments. Control of broadleaf weeds was most successful and corn yields were highest when weeds were killed before they exceeded a height of four inches in newly emerged corn.

PRE-EMERGENCE HERBICIDES

The herbicides that consistently gave a useful level of pre-emergence weed control in corn were atrazine (AAtrex), propachlor (Ramrod), alachlor (Lasso), and butylate (Sutan).

The important characteristics of these herbicides were:

AAtrex — gave fair control of grass weeds and excellent control of broadleaf weeds. Corn had a wide margin of tolerance to the chemical. Soil persistence was the major objection to the chemical. At effective weed control rates, it damaged broadleaf crops for one to two years after use in corn.

Ramrod — gave good grass control, but control of pigweeds, lambsquarters and nightshades ranged from fair to poor. Corn had good tolerance to the chemical; soil persistence was limited to the crop year of use.

Lasso — gave excellent grass control and fair control of most broadleaf weeds. Control of lambsquarters and nightshade was sometimes marginal. Corn had good tolerance to the chemical; soil persistence was limited to the crop year of use.

Sutan — gave excellent grass control but control of broadleaf weeds was poor. It occasionally caused slight corn injury, but the injury was transient and did not affect corn yield. Soil persistence was of short duration.

POST-EMERGENCE HERBICIDES

The consistently effective post-emergence herbicides were DNBP-amine (Premerge or Sinox PE), 2,4-D-amine (various tradenames) and AAtrex + non-toxic oil. Their important characteristics were:

DNBP-amine — with proper timing, gave effective control of small broadleaf weeds. It cause some contact injury to emerged corn but injury was transient and did not affect corn yields. Persistence was of short duration, but with favorable moisture it was sometimes possible to kill two crops of broadleaf weeds.

2,4-D-amine — with proper timing and spray placement, gave cheap and effective control of broadleaf weeds in grain and silage corn. It was too hazardous for most sweet corn inbreds and risky on commercial sweet corn varieties.

AAtrex + oil — gave good control of relatively large broadleaf weeds, but was not effective on grass weeds. Soil persistence was the same as the AAtrex rate used on a pre-emergence basis.

Thus, from the standpoint of weed control, corn tolerance, and soil persistence, no herbicide was entirely satisfactory. The most effective treatments were herbicide combinations that teamed a good grass killer with a good broadleaf killer.

EFFECTIVE HERBICIDE TREATMENTS

Over a three-year period, the following treatments gave reasonably effective weed control on the experimental plots. Note the crop for which each treatment is indicated and the restrictions on cropping sequence.

The treatments are registered and have label clearance at this time for the use specified. But before using the herbicides, read the label and follow the directions.

Treatment No.	Herbicide(s) and Rate(s)*	Indications, Methods and Remarks
I	1-1/4 lb-AAtrex + 2 qts-Lasso	For weedy fields where grain or silage corn will be grown and where corn can follow corn. Apply pre-plant and incorporate 2 inches deep to moisture.
II	1-1/4 lb-AAtrex + 6 lb-Ramrod	The same as for Treatment I except that the crop will be sweet corn.
III	3 qts-Lasso	The same as Treatment I except that corn will not follow corn. A supplemental treatment for broadleaf weeds might be necessary.
IV	9 lb-Ramrod	The same as for Treatment II except that corn will not follow corn. A supplemental treatment for broadleaf weeds will likely be necessary.
V	4-1/2 pt-Sutan	For fields having a known preponderance of grass weeds where corn will not follow corn. Apply pre-plant and immediately incorporate 3 or more inches deep. A supplemental treatment for broadleaf weeds will likely be necessary.
VI	3 qt-DNBP-amine	For killing small broadleaf weeds as corn emerges. Apply as an over-the-top broadcast when approximately 10 percent of the corn spikes have emerged and the broadleaf weeds are not beyond the 2-leaf stage. A useful supplement to Treatments III, IV and V.
VII	1 to 1-1/2 qt-2,4-D-amine	For broadleaf weeds in grain or silage corn. Apply with spray directed to avoid over-the-top contact with corn foliage. Useful as a supplement to Treatments III and V. Do not use on sweet corn inbreds or on commercial sweet corn without prior approval of fieldmen.
VIII	1-1/4 lb-AAtrex + 1 gal. non-toxic emulsifiable oil in water sufficient to make a spray volume of 20 to 40 gal. per acre	For killing broadleaf weeds 3 to 4 inches tall that are in the corn row and cannot be controlled by the layby cultivation. Direct the spray low in the corn row but high enough to cover the tallest weeds. The weeds will die slowly. Control of grass weeds will not be effective.

* All rates are expressed in terms of chemical product per acre on a broadcast basis. For band treatments, reduce the rate in proportion to the area actually treated.

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Trade names are used only to identify the chemicals as they are known in the marketplace. No endorsement by the University is intended.

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JAMES E. KRAUS, Director