



Current Report

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Herbicide Use in Lo-Till Wheat Production

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A good weed control program is essential for reduced tillage farming to be successful. The basic management systems developed thus far depend heavily upon several different types of herbicides which are often used in combination with mechanical tillage. The purpose of this manuscript is to provide information about several herbicides that can be used in reduced tillage systems.

Herbicide Types

There are three main herbicide types that can fit into these programs. It is important to know what each type herbicide will do in your system.

- (1) Contact Herbicides: These are chemicals that kill weeds by contact with the plants, specifically Paraquat, Gramoxone, etc. They are non-selective and will kill most annual plants they are sprayed on, but have no effect on weed seeds that have not germinated and are inactive after contact with the soil. Perennial plants, like johnsongrass, are burned when sprayed but regrow after a few weeks. Timing and environmental conditions are critical to effective control. Large annual plants, especially grasses like crabgrass, are difficult to control and require high rates of chemicals. Small succulent weeds can be controlled with lower rates. High temperatures aid in effectiveness, but hot, dry, windy conditions greatly reduce weed control. Effective paraquat applications are best made in the pre-dawn or early morning hours when dew is often on foliage and winds are calm.
- (2) Foliar-Applied, Translocated Herbicides: These are chemicals that are applied postemergence to actively growing weeds. They differ from contact chemicals because they move into the plant and disrupt the growing points. They are also slower acting. These herbicides are not dependent on soil type to determine rate and performance, but rainfall occurring too soon after application may wash them off the plant before enough uptake has occurred to kill it. However, moisture is important because stressed plants do not adequately translocate the herbicide. Chemicals like 2,4-D, Banvel, Roundup and Glean are examples that fit into this category.
- (3) Soil-Applied, Preemergence Herbicides: This is the big group of herbicides that are used in many of our row crops. It includes Surflan, Bladex, Igran, atrazine, Sencor, Lexone and many others. They are taken up by the plant roots from the soil. Most of them are affected by the soil texture, pH and organic matter. These factors determine the rate required per acre for effective weed

control without crop injury or carry-over to succeeding crops. Generally these chemicals require rainfall for activation, but will remain stable on the soil for several weeks after application. This factor is important in reduced tillage as they do not require soil incorporation after application.

PARAQUAT

Paraquat is a contact type of herbicide. It is used to burn down weeds that are already up and growing at the time of herbicide application. There are two formulations of paraquat available on the market; Gramoxone paraquat and Ortho Paraquat-Plus. Recommended rates of paraquat range between 1 and 2 pints per acre, either used alone or in tank mixes with a residual type herbicide such as Bladex 80W or Igran. The use of an adequate volume of water and surfactant with the herbicide is necessary to get good coverage of the weeds and thus good control. Paraquat can be used in repeat treatments throughout the summer when weeds become a problem. It should be applied when weeds are small for the most effective performance.

ROUNDUP

Roundup is a translocated herbicide that is sometimes used to kill existing vegetation. One quart per acre gives good control of most small annual weeds. Lower rates will control certain species of weeds. It is necessary to read the label to determine the minimum amount needed for each specific weed problem. When low rates of one quart or less are used, extra surfactant should be added. Roundup can be used effectively for early weed control soon after harvest or later in the season. It is not taken up from the soil, therefore residual carryover in the soil is not a problem. Roundup is a very effective herbicide for the control of volunteer wheat and cheat that comes up in the fall before planting the crop. Growing conditions should be good and weeds should not be under stress when Roundup is applied. Roundup should not be mixed with other herbicides, unless designated on the label. This herbicide is especially effective for control of "tough" weedy grasses. Higher rates may be used for control of certain perennial weeds.

BLADEX 80W

Bladex 80W is a soil-applied, preemergence type of herbicide that has received a 24 (C) label for use in reduced tillage systems in Oklahoma. Bladex may be mixed with a contact type of herbicide such as paraquat or with a broadleaf herbicide such as 2,4-D. This type of mixture is important for control of existing weeds at time of application. Bladex needs rainfall to activate it so that weeds take it up from the soil as they germinate. Bladex should be applied soon after harvest so that it will dissipate from the soil in time to plant another crop. It is important to read the 24 (C) label which the Chemical dealer should supply to you to determine which weeds Bladex will control and how to effectively use it.

IGRAN 80W

Igran 80W is another soil-applied preemergence type of herbicide that has received a 24 (C) label for use in reduced tillage systems in Oklahoma. Igran may be mixed with a contact herbicide such as paraquat or a broadleaf herbicide such as 2,4-D for control of existing weeds at the time of application. Igran needs rainfall to activate it since it is taken up by weeds from the soil. Apply Igran either alone or in tank mixtures as soon as possible following wheat harvest. It can also be mixed with Aatrex to broaden the spectrum of weeds controlled and the length of control. Read the 24 (C) state label provided by the Chemical dealer for further details.

AATREX

Aatrex is another soil-applied, preemergence type of herbicide that has been approved under a 24 (C) state label to use at low rates in tank mixtures for control of annual weeds during the idle season following winter wheat harvest. Be sure to consult the 24 (C) label for rates to use, and pH and soil restrictions.

SURFLAN

Surflan is another soil-applied, preemergence type of herbicide. Surflan is approved under an experimental label for use on a limited acreage of wheat. Surflan should be applied after wheat is fully tillered and beginning to joint. It is effective for control of grassy type weeds and some broadleaf species. It can be used in a mixture with a herbicide that controls broadleaf weeds effectively such as Glean or MCPA. It is taken up from the soil to kill weeds as they germinate and begin growth, thus it may not control weeds that come up before application. Surflan needs rainfall to activate it.

BANVEL

Banvel is a translocated herbicide for broadleaf weed control. It may be applied after harvest by broadcast or as a spot treatment to emerged, actively growing weeds. Rates of 1/2 to 1 pint per acre will provide good control of small (less than two inches tall) annual broadleaf weeds. Higher rates are required to kill larger weeds. Perennial broadleaf weeds such as bindweed can be controlled by applying 2 to 4 pints per acre during the bud to flowering stage of growth. Wheat may be planted in the fall following Banvel applications without crop injury as long as the interval between application and planting is at least 45 days per pint of product used per acre. Some wheat injury may occur in use of higher rates for perennial weed control because the interval between application and planting of wheat may not be adequate to completely escape injury.

2,4-D

2,4-D is another translocated herbicide manufactured under numerous trade names and different formulations. This phenoxy herbicide will control a number of broadleaf weeds at rates ranging from 1/2 to 2 lb/A depending on weed species and size. If broadleaf weeds are the primary problem, this herbicide can be used throughout the summer whenever a weed population occurs. Be sure to study information on ester and amine formulations and drift problems associated with some formulations before choosing which one you will use.

GLEAN

Glean is a relatively new herbicide that controls broadleaf weeds from uptake from both the foliage and the soil. It is a safe herbicide to use in wheat if soil pH does not exceed 7.5. It should not be used where crops other than wheat or barley will be rotated to the land. The best usage of this herbicide would be either in the spring in growing wheat before the boot stage or soon after harvest for control of weeds during the idle season. Fall applications would not leave an adequate amount in the soil the next summer to control many weed species.

Lo-Till Systems

No one system is the one "best system" for conservation tillage because there are so many variables. However, there has been successful programs with the following types of systems for continuous wheat.

System I - Preharvest Herbicide Application: Surflan is a preemergence soil-applied herbicide that controls primarily grasses. For this reason, it should be applied in wheat before grassy weeds that you plan to control have emerged. Glean is a foliar-applied translocated herbicide that has soil residual properties. It is mainly a control for existing and emerging broadleaf weeds. These materials, when applied in a mixture at the proper time, should provide grass and broadleaf weed control until fall planting. In some years, weed breakthrough may necessitate either a relatively early tillage, anhydrous ammonia application or the use of a contact herbicide. No tillage should be performed after harvest because the herbicide layer will be destroyed. If rains occur before planting, and volunteer wheat and/or cheat germinate, they should be controlled with a low rate of Roundup, rod-weeder or mulch treader to avoid destruction of additional residue and loss of planting moisture. Surflan can only be used on a limited acreage in 1983 because it is only approved on an Experimental Label this year. Either Surflan or Glean can be used without the other, but the spectrum of weed control will not be as good as with the mixture.

System II - After Harvest Residual Herbicide: Bladex 80W and Igran 80W are soil-applied residual herbicides for control of grassy and broadleaf weeds that can be applied immediately after wheat harvest. These herbicides control weeds as they germinate throughout the summer if rainfall occurs to activate them. If applied without tillage, it is desirable to use Paraquat, Gramoxone, 2,4-D or Roundup to kill established weeds in the stubble. A light mechanical tillage (sweep or disc.) can be used after harvest in lieu of herbicides before the Bladex or Igran application. Tillage may reduce some effectiveness of the herbicides if it creates a cloddy soil surface. A recent 24 (C) label allows use of Aatrex at 1/4 to 1/2 lb/A in mixtures with Bladex or Igran on many soils. Do not use atrazine on soils with pH of greater than 7.0 or on sands or in the Oklahoma Panhandle.

System III - After Harvest Repeat Herbicide Applications: In some parts of the state where only summer broadleaf weeds are expected or where populations are low in stubble fields, one timely application of 1/3 ounce of Glean, 1/2 pound of 2,4-D or recommended rates of Banvel or Banvel + 2,4-D mixtures may result in adequate weed control. Other herbicides such as Roundup or Paraquat can also be used. The system calls for use of a herbicide that will control the weeds present whenever weed growth occurs throughout the summer, and that can be applied more than one time if needed.

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