

AGRONOMIC Spotlight



Technology
Development
by MONSANTO

Converting Failed Wheat Acres to Corn

February 2010

Wet conditions last fall did not allow the planting of nearly 6 million acres of wheat. In addition, the acres that were planted may not make it through the harsh winter due to insufficient fall growth. Planting corn to replace failed wheat acres is a viable alternative as long as proper preparation and management take place prior to spring.

In order to achieve success, the existing wheat must be properly eliminated. A delayed or damaged wheat crop is not necessarily dead and may remain green and initiate new tillers. Even though it may not be as competitive as thriving wheat, delayed or damaged wheat can still compete for soil moisture and nutrients. Another factor to consider is eliminating the crop residue from the field. This is important for two reasons. First, it reduces any competition from insects that were initially attracted to the wheat that might feed on young corn plants. Second, the break down of the wheat crop residue may have an allelopathic, or toxic, effect on corn following wheat. Eliminating the failed wheat crop can be achieved by removing the bulk of the wheat for use as forage, herbicide burndown, or tillage. These management techniques can be used as a combination together or by themselves, depending on the operation.

Elimination of the failed wheat crop:

Forage. Removing the bulk of the wheat plant for use as a forage via grazing or hay can help get most of the plant material out of the field. If wheat is used as forage it should be tested for nitrate levels before it is fed to livestock. A nitrate level higher than 6,000 ppm has the potential to be toxic. Nitrate levels in wheat are related to fertilization. Samples found to be toxic generally come from fields that were fertilized just prior to receiving a damaging frost. Dr. Nafziger, from the University of Illinois, indicated since the wheat delay this year has taken place prior to the nitrogen (N) topdress window, it is reasonable to assume most people will not make the application. As a result nitrate toxicity should not be an issue this season. However, when nitrate toxicity is a possibility move the livestock to an alternate forage source and call your veterinarian.

Herbicides. Carryover from any herbicides used in the wheat crop should be evaluated prior to the corn replant. Some herbicides will not allow another crop to be planted that season while others, have a set interval of required days between application and planting. Table 1 lists some of these intervals.

ALWAYS READ AND FOLLOW LABEL DIRECTIONS

If the herbicides used in the wheat crop do allow another crop to be planted, choosing a burndown herbicide to kill the remaining wheat may be the next step. If herbicides and tillage will be used to control winter wheat, applying the herbicide 3-5 days before tillage is frequently recommended. If the herbicide will be applied

Table 1. Interval between herbicide application and replanting of corn per label instructions .

Wheat Herbicide	Interval between application and planting corn
Axial®	120 days
2,4-D	7 to 14 days
Buctril®	30 days
Clarity®	0 days
Finesse® Grass and Broadleaf	Conduct field bioassay the following year
Harmony® EXTRA	14 days
Harmony® GT	0 days
Hoelon®	Not available
Prowl®	Not approved for the same year
Osprey™	12 months
Sencor®	4 months

(Adapted from University of Kentucky 2007)

without the use of tillage, waiting until daytime air temperatures are above 50 degrees F and nighttime air temperatures are above 40 degrees F can allow for improved herbicide activity. In either situation, leaving as much time as possible between the herbicide application and emergence of the corn is best. Finally, if the option to plant corn quickly is needed, using a quick killing burndown herbicide can be most effective. The list below provides herbicide options for wheat burndown:

- I. Glyphosate can be an inexpensive, effective way to kill remaining wheat.
 - A. A rate of 1.5 lb ae/A can be applied.
 - B. For no-till, a 2,4-D ester at a rate of 0.5 to 1 lb/A can be applied to help with control of emerged glyphosate-resistant marestalk and giant ragweed, and generally improve control of lambsquarters and most other broadleaf weeds. A spray volume of 10 to 15 gpa can be applied and an AMS should be included if applying in hard water.
 - C. May not kill as fast as other herbicides.
- II. Paraquat with a photosynthetic inhibitor (atrazine or metribuzin) can be applied.
 - A. A rate of 2 to 3 pt/A of paraquat can be applied with atrazine at a rate of at least 1.5 lb ai/A. If necessary apply with 2,4-D ester (0 to 1 lb/A).
 - B. Paraquat treatments should be applied with crop oil

(continued on page 2)

(Continued from page 1)

concentrate and 28% liquid nitrogen, and are most effective when 28% is used as the spray carrier. Use a spray volume of 15 to 20 gpa.

C. Paraquat mixed with atrazine may be the most expensive option with paraquat and metribuzin being slightly cheaper.

III. Burndown herbicide applications may not have consistent control of wheat therefore, planting Roundup Ready® Corn 2 can allow for additional control possibilities after corn crop emergence.

Increased chance of armyworm, black cutworm and wireworm. Since wheat and corn are both grasses there is a potential for grass loving insects, such as armyworm, black cutworm and wireworm, to be problematic in corn planted after wheat. As a general explanation, since the number of wheat plants per acre is much higher than the number of corn plants per acre, the insect thresholds are much higher for wheat compared to corn. After the wheat crop is removed, the insect populations may remain above the acceptable thresholds for the corn crop. In addition, decaying organic matter from the wheat residue may provide a place for these insects to hide from natural enemies, and protect themselves from pesticides.

Being aware of the level of control your corn product and seed treatment offer is imperative. Some B.t. products, such as Genuity™ SmartStax™ corn, are labeled for control of black cutworm while others suppress black cutworm. In addition, some seed treatments offer control of black cutworm and wireworm. However, seed treatments may contain a low rate preventative neonicotinoid insecticide that may not have the desired level of protection for the potentially high insect populations. Scouting fields for armyworm, black cutworm and wireworm that have been converted from wheat to corn is recommended until corn plants reach 12 to 18 inches in height. A traditional in-furrow application of a granular soil insecticide may also be an appropriate management tactic for heavy infestations.


Nitrogen applied to Wheat – What is left for the corn? If nitrogen (N) has been applied to wheat there may be some N available for the corn. However, Dr. Nafziger said most of the wheat with damage this year will have very poor growth coming out of dormancy and many people will not have enough healthy wheat plants to consider topdressing the crop with N. Therefore, this year N credits for replacement corn will be more or less a moot point. As a general rule when N has been applied to wheat, half the total N applied for the wheat crop can be considered available to the replacement corn crop, if the wheat was clearly past jointing when it was damaged. If smaller wheat was damaged, especially if N was applied late, then up to 3/4 of the N should be available to the following corn crop.

Conclusions:

- Eliminating the wheat crop is imperative for the replacement corn crop.
 - Stops competition for moisture between wheat and corn crop
 - Wheat residue can be allelopathic (toxic) to corn
 - Wheat residue can harbor elevated grass loving insects
- Previously applied wheat herbicide(s) labels must allow for corn as a replant.
- Wheat may be eliminated by removing for forage, applying burndown herbicides, tilling, or a combination of herbicides and tilling.
- Increased potential of black cutworm, armyworm, and wireworm problems when corn follows wheat. Scouting for additional insect control is recommended and an in-furrow application of granular soil insecticide may be warranted.
- If wheat is past jointing when damaged, half of the total N applied for the wheat may be considered available to the replanted corn. If smaller wheat was damaged 3/4 of the N should be available.

Sources: Bessin, R., Johnson, D. 2007. RISK OF PLANTING CORN INTO STANDING WHEAT. University of Kentucky. Available On-line: <http://www.uky.edu>; Ellis, S. 2007. The farm gate. April 27, 2007. University of Illinois.; Ferguson, J.J.; Bala Rathinasabapathi, B. 2009. How Plants Suppress Other Plants. University of Florida.; Gray, M. 2007. Planting Corn Following Wheat: Wireworms May Present Challenges in Some Fields. The Bulletin. IPM. University of Illinois. No. 4 Article 1/April 20, 2007.; Loux, M. 2007. C.O.R.N Newsletter 2007-09 April 17, 2007 - April 23, 2007. Ohio State University.; Nafziger. 2007. Epilogue on the April Freeze: Tough Decisions Remain. The Bulletin. IPM. University of Illinois. No. 4 Article 6/April 20, 2007.; Martin, J.R. 2007. CONTROL OF DAMAGED WHEAT AND CROP. University of Kentucky. Available On-line: <http://www.uky.edu>

Monsanto Company is a member of Excellence Through Stewardship® (ETS). Monsanto products are commercialized in accordance with ETS Product Launch Stewardship Guidance, and in compliance with Monsanto's Policy for Commercialization of Biotechnology-Derived Plant Products in Commodity Crops. This product has been approved for import into key export markets with functioning regulatory systems. Any crop or material produced from this product can only be exported to, or used, processed or sold in countries where all necessary regulatory approvals have been granted. It is a violation of national and international law to move material containing biotech traits across boundaries into nations where import is not permitted. Growers should talk to their grain handler or product purchaser to confirm their buying position for this product. Excellence Through Stewardship® is a registered trademark of Biotechnology Industry Organization. **B.t. products** may not yet be registered in all states. Check with your Monsanto representative for the registration status in your state. **Individual results may vary**, and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible. **ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS.** Roundup Ready® crops contain genes that confer tolerance to glyphosate, the active ingredient in Roundup® brand agricultural herbicides. Roundup® brand agricultural herbicides will kill crops that are not tolerant to glyphosate. Genuity™, Roundup®, Roundup Ready®, Roundup Ready 2 Technology and Design™, SmartStax™, and Technology Development by Monsanto and Design(SM) are trademarks of Monsanto Technology LLC. Ignite®, LibertyLink® and the water droplet are registered trademarks of Bayer. Herculex® is a trademark of Dow AgroSciences LLC. Respect the Refuge® and Respect the Refuge and Corn Design® are registered trademarks of National Corn Growers Association. All other trademarks are the property of their respective owners. ©2010 Monsanto Company. AMB022210



Before opening a bag of seed, be sure to read, understand and accept the stewardship requirements, **including applicable refuge requirements for insect resistance management**, for the biotechnology traits expressed in the seed as set forth in the Monsanto Technology Agreement that you sign. By opening and using a bag of seed, you are reaffirming your obligation to comply with the most recent stewardship requirements.

