Wisconsin Crop Manager

Volume 16 Number 3 --- University of Wisconsin Crop Manager --- March 12, 2009

Annoucements…

Weeds

Healthy Grown Potato Certification Program Sign Up

The 2009 Healthy Grown/Protected Harvest potato certification season is ready to begin. Healthy Grown fresh market potatoes are certified and sold as an environmentally responsible produce option, and have been available since 2001. Currently, about 10% of Wisconsin's fresh market potatoes are certified under the program. For more information about the program, visit www.healthygrown.com.

To be eligible for the program in 2009, you must get your application into Protected Harvest by March 1, 2009. The latest version of the Healthy Grown Ecological Potato Standard and is available from Dr. Deana Knuteson at dknuteson@wisc.edu or 608.265.9798. Please contact Deana if you have any questions about the program or certification procedures. For information on the application materials, please contact Dan Sonke at Protected Harvest/SureHarvest at 831-477-7797 or dsonke@protectedharvest.com with any questions.

Frost Seeding Red Clover into Winter Wheat publication now available for download

Kevin B. Shelley, UW Nutrient and Pest Management Program

Direct link to file >>> Frost Seeding Red Clover file

A new publication entitled Frost Seeding Red Clover in Winter Wheat is now available from the University of Wisconsin Extension Nutrient and Pest Management Program. This four-page publication describes the practice of frost seeding (over-seeding in early spring) medium red clover into winter wheat that was planted the previous fall.

The publication's objective is to help farmers evaluate the economic potential of using red clover as a green manure cover crop, providing biologically fixed nitrogen to the following year's corn crop. This is in addition to the soil quality, soil conservation and weed suppression benefits likely to accrue.

The publication emphasizes recommended practices for managing the red clover for maximum yield of creditable nitrogen while allowing for optimum wheat production. This includes clover seeding rates and the "art" of frost seeding, weed management in both wheat and the following clover stand, and successful termination of the clover before corn. Estimating the optimum nitrogen fertilizer rate for the following corn crop is also covered. Measuring the practice's value is described relative to clover biomass production, the cost of clover seed and the price of nitrogen fertilizer.

The information provided is based on data collected from a combination of research station trials and on-farm experience in Wisconsin from 1991 to 2008.

Wisconsin is winning the battle against glyphosate-resistant weeds

A press release by Chris Boerboom and Paul Mitchell, UWEX

The best way to win a battle is to not fight the battle in the first place. This is certainly the case with herbicide resistant weeds. If weeds don't become resistant, growers can keep using existing herbicides to control them. Most recently, glyphosate-resistant weeds have been at the top of the list of concerns. Roundup Ready crops were launched in 1996 and the first report of a glyphosate-resistant weed in the U.S. was horseweed (or marestail) in the year 2000.

Chris Boerboom, UW-Extension weed scientist, says "Across the Midwest, we saw the potential of resistance if growers were only going to use glyphosate in corn and soybeans without using other herbicides or practices to break up the cycle."

Because of this risk, UW-Extension hosted a Glyphosate Resistance Roundtable in 2003 for Wisconsin's agricultural groups to discuss the risk of glyphosate resistance and comment if continued education was needed. With this meeting, Wisconsin's major commodity, consulting, and retail associations became national leaders and endorsed a Glyphosate Stewardship White Paper, which supported practices to avoid developing resistance.

During the past five years, no cases of glyphosate-resistant weeds have been documented in Wisconsin while most other Midwest states have reported one or more glyphosate-resistant weeds such as giant ragweed, common ragweed, waterhemp or horseweed.

"We've spent a lot of time with Wisconsin corn and soybean growers discussing resistance and practices to reduce the risk of glyphosate-resistant weeds," says Boerboom. "I think most of our growers and their advisers are doing a relatively good job using diverse weed management programs."

What might set Wisconsin apart? An important practice to slow or avoid the development of resistance is to reduce the number of times glyphosate is used, which can be done by rotating herbicide modes of action. It could be using conventional herbicides in corn and then using glyphosate in soybeans or it could be using a preemergence herbicide followed by glyphosate in the same season.

As it turns out, Wisconsin corn and soybean growers may be national leaders in the practice of using multiple herbicides or rotating herbicides. Paul Mitchell, UW-Extension agricultural economist, notes, "We just completed a national survey of corn, soybean, and cotton growers on their weed management practices and found Wisconsin growers were unique. Growers in Wisconsin were more likely to rotate herbicides than corn and soybean growers in any other state, which is likely a major reason we have not had glyphosate-resistant weeds in Wisconsin yet."

Mitchell and Boerboom hope that growers and the agriculture industry in Wisconsin remain leaders in glyphosate stewardship and leave the glyphosate-resistant weed battles to other states. However, they both agree that glyphosate-resistant weeds will eventually show up in Wisconsin and growers will have to spend more to control them. Mitchell and Boerboom hope to delay that day as long as possible.

Waterhemp Management – Advice from Missouri

Chris Boerboom, Extension Weed Scientist

My weed science colleagues at the University of Missouri have many years of experience in managing waterhemp, including waterhemp biotypes that are glyphosate, ALS-, and PPO-inhibitor resistant. This winter they published a new bulletin focused on waterhemp management in corn and soybean titled *Management of Glyhosate-Resistant Waterhemp in Corn and Soybean*, bulletin IPM1030 (http://extension.missouri.edu/explorepdf/agguides/pests/ipm1030.pdf). A few remarks from this bulletin are certainly worth considering for those in Wisconsin who also have waterhemp in their fields.

Key waterhemp facts

- Seedling ID: looks like pigweed, but with NO hairs and shiny leaves.
- Mature ID: seedheads are soft and narrow vs pigweeds with thick bristly seedheads.
- Produce about 250,000 seeds per plant (only on female plants; no seeds on male plants).
- Can emerge after residual herbicides degrade or after postemergence herbicides are applied.
- Late season escapes lead to continued waterhemp populations.
- Resistance documented to atrazine, glyphosate, ALS herbicides (i.e. Harmony, Pursuit, Raptor), and PPO herbicides (i.e. Blazer, Cobra, Flexstar).
- The level of glyphosate resistance in the first confirmed resistant plants was 19 times greater than susceptible waterhemp.

Waterhemp management in corn

The Missouri weed scientists note many non-glyphosate herbicides are available to control glyphosate resistant waterhemp including preemergence and postemergence products. Preemergence herbicides include the grass herbicides (i.e. Dual, Harness/Surpass, Outlook, etc.), their atrazine premixes (i.e. Bicep Lite, Keystone LA, G-Max Lite, etc), and mesotrione products (i.e. Camix, Lumax). Post herbicides include atrazine, dicamba-based products (i.e. Banvel, Clarity, Status, etc.), HPPD herbicides (Callisto, Impact, Laudis), and Ignite. Of course, post treatments must be applied at the correct waterhemp size to be effective.

Waterhemp management in soybean

Preemergence herbicides are key in managing glyphosate-resistant waterhemp in soybean and are more effective than postemergence PPO-inhibiting herbicides. In populations that are glyphosate, ALS, and PPO resistant, they state "there are essentially no postemergence tank mix options for control". Row cultivation is the only option to control resistant waterhemp plants that escape treatment. Ignite is an option in LibertyLink soybeans, but the best program is still a preemergence herbicide followed by Ignite before waterhemp exceeds 4 inches.

The following table lists the soybean herbicides with excellent or good ratings from the bulletin.

Preemergence herbicides		Postemergence herbicides	
Authority Assist	Excellent	Cobra/Phoenix	Good/Excellent
AuthorityFirst/ Sonic	Excellent	Flexstar	Good/Excellent
Authority MTZ	Excellent	Ultra Blazer	Good/Excellent
Boundary	Excellent	Ignite	Good
Prefix	Excellent		
Dual II Magnum	Good/Excellent		
Enlite	Good		
Outlook	Good		
Gangster	Good		
Valor SX	Good		

While we do not have any confirmed glyphosate-resistant waterhemp in Wisconsin, we should maintain a diversity of herbicide use to prevent its development. Using alternate herbicides in corn fields with waterhemp is one strategy. Another strategy to consider is the use of preemergence herbicides in soybean fields that have a history of waterhemp.

Figure 1: Pigweed seedhead left; waterhemp seedheads right.

Herbicide Product Conversions

Chris Boerboom, Extension Weed Scientist

I received a couple good questions about herbicide rate conversions lately. One example was calculating how much Pursuit and Prowl H_2O should be mixed to equal the Pursuit Plus (which is no longer being manufactured). Unless a person deals with these types of calculations frequently, they may be a challenge. With this article, I will demonstrate how you can make these types of conversions and the information that you need.

First, if you are interested in knowing the general composition of some of the common corn and soybean herbicide premixtures, there are two handy tables in the *Pest Management in Wisconsin Field Crops* bulletin, A3646. In the 2009 edition, check out these tables.

Rate equivalents of corn herbicide premixes – page 53

Rate equivalents for soybean herbicide premixes – page 120

While the rate you are using might differ from the rates listed in these tables, they will give you a good understanding of the ratio of the components. For instance, 2.4 oz of Gangster is equivalent to 2 oz of Valor and 0.4 oz of FirstRate.

However, the information in these tables does not answer the original question of how much Pursuit and Prowl H_2O to mix to equal 2.5 pt/a Pursuit Plus. For these types of questions, we need to deconstruct the original herbicide down to its active ingredients and then reconstruct it into the herbicides of interest. I will use an example to show how this is done.

Step 1. Find amount of Pursuit in 2.5 pt/a Pursuit Plus

- Check Pursuit Plus label (or Table 1a, p. 227 in A3646 bulletin) to find concentration of imazethapyr, which is 0.2 lb/gal.
- Convert Pursuit Plus use rate to gallon rate >>>
  2.5 pt/a Pursuit Plus ÷ 8 pt/gal = 0.3125 gal Pursuit Plus/a
- Determine amount of active ingredient in use rate (this is the deconstruction) >>>
  0.3125 gal/a × 0.2 lb imazethapyr/gal = 0.0625 lb imazethapyr/a
- Check Pursuit label (or Table 1a, p.227 in A3646) to find concentration of imazethapyr, which is 2 lb/gal to convert back to Pursuit (start reconstructing).
- Determine gallons of Pursuit needed to provide a 0.0625 lb rate of imazethapyr. >>>
  0.0625 lb imazethapyr/a ÷ 2 lb imazethapyr/gal = 0.03125 gal Pursuit/a
- Convert gallons of Pursuit to ounces. >>>
  0.03125 gal/a × 128 oz/gal = 4 oz/a of Pursuit

Step 2. Repeat to find amount of Prowl H_2O in 2.5 pt/a Pursuit Plus (I'll just do the calculations using the same steps as above).

- 2.5 pt/a Pursuit Plus ÷ 8 pt/gal = 0.3125 gal Pursuit Plus/a
- 0.3125 gal/a × 2.7 lb pendimethalin/gal = 0.8438 lb pendimethalin/a
- 0.8438 lb pendimethalin/a ÷ 3.8 lb pendimethalin/gal = 0.222 gal Prowl H_2O/a
- 0.222 gal/a × 8 pt/gal = 1.78 pt/a of Prowl H_2O

The answer is 2.5 pt/a Pursuit Plus = 4 oz/a Pursuit + 1.8 pt/a Prowl H_2O.

Similar calculations can be used to determine the rate equivalents of other products or to convert from one formulation to another. For example, how much of Nufarm's 2,4-D LV6 would it take to equal a 1 pt/a rate of Nufarm's 2,4-D LV4?

1 pt/a LV4 ÷ 8 pt/gal = 0.125 gal LV4/a

0.125 gal LV4/a × 3.84 lb 2,4-D/gal (in the LV4) = 0.48 lb 2,4-D/a

0.48 lb 2,4-D/a ÷ 5.5 lb 2,4-D/gal (in the LV6) = 0.0873 gal/a LV6

0.0873 gal/a × 8 pt/gal = 0.7 pt/a of LV6

For a practice problem, calculate the amount of Touchdown Total that would be equivalent to the glyphosate rate in 4 pt/a of Halex GT. For hints, Halex GT has 2.09 lb glyphosate/gal and Touchdown Total has 4.17 lb glyphosate/gal. Is the correct amount?

a. 22 oz/a Touchdown Total
b. 24 oz/a Touchdown Total
c. 32 oz/a Touchdown Total
d. 36 oz/a Touchdown Total
e. I need more practice, but I can always come back and follow these examples.