2007 Indiana Weed Science Update

In the winter months Bill, Tom, and I spend time traveling around the state of Indiana providing information and continuing education credit hours for Indiana’s Pesticide Applicators. In many cases we present information concerning new herbicides and changes of existing herbicides. Keeping up on herbicides and their regulations is a full time job in itself. If you should happen to miss one of these presentations, but would like to read up on new developments in herbicide and weed science, this article is a companion to the “2006 Weed Control Update”.

CORN

Impact - AMVAC Chemical Corp

Impact was released last year, but several questions regarding the product leads us to putting it in the update again this year.

This is an introduction of the active ingredient topramezone (2.8 lb ai/gal). Impact’s active ingredient is similar to the hpd inhibitor in Callisto (mesotrione). However, unlike Callisto, it does have some activity on annual grasses other than just large crabgrass. The two products are both rated as having excellent crop tolerance.

Impact can be applied from 0.5 to 0.75 fl oz/A with MSO or COC plus UAN or AMS up to 45 days before harvest. Similar to Callisto, the addition of atrazine can increase control. Atrazine can be tankmixed from 0.25 to 1.5 lb ai/A up to 12” corn. Impact is not to be tank mixed with products that contain mesotrione (Callisto, Lumax, etc).

Rotation restrictions for Impact are 3 months to small grains and 9 months for soybean and alfalfa. Although rare, there have been a few instances where Callisto has carried over into the following growing season, this may occur with Impact also.

Status - BASF

Status is a premix of diflufenzopyr plus dicamba, similar to Distinct except that Status has a new safener called isoxadifen to reduce instances of corn damage due to brittle stalks.

In research conducted at Purdue University where extreme mechanical damage was induced, Status did have reduced damage when compared to similar products (table 1).

Table 1. Stand loss in corn that with simulated damage

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Number plants Lost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Treated</td>
<td>2</td>
</tr>
<tr>
<td>Status + NIS + AMS</td>
<td>2 6</td>
</tr>
<tr>
<td>Status + NIS + AMS</td>
<td>5 6</td>
</tr>
<tr>
<td>Distinct + NIS + AMS</td>
<td>5 9</td>
</tr>
<tr>
<td>Distinct + NIS + AMS</td>
<td>8 22</td>
</tr>
<tr>
<td>Sterling + NIS + AMS</td>
<td>14 12</td>
</tr>
<tr>
<td>Sterling + NIS + AMS</td>
<td>13 10</td>
</tr>
<tr>
<td>Callisto + Aatrex + COC + AMS</td>
<td>2 0</td>
</tr>
<tr>
<td>Non-Treated</td>
<td>1</td>
</tr>
</tbody>
</table>

*Stand loss was measured by making counts before application and 4 days after treatment. Mechanical damage was simulated by dragging a metal bar through corn 4 inches above the ground.

Status can be applied alone at 5 to 10 oz, but it is being positioned as a tank mix partner with glyphosate in Roundup Ready management systems at 2.5 to 10 oz/A.

Autumn - Bayer

Autumn is a herbicides being marketed for fall applications and spring burndown. It is one of the components of Equip.
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(iodosulfuron) sold alone. It can be applied alone or in a tank mix with 2,4-D, Sencor, or glyphosate at 0.3 oz/A. In the spring, Autumn can be applied at least 30 days before planting. COC at 1% should be included. Soybean can be planted in 9 months and winter wheat can be planted in 4 months after application.

In Purdue University herbicide trials, Autumn performed well at 0.3 oz/A, controlling dandelion and cressleaf groundsel 179 days after treatment at 98 and 100%, respectively. However, Autumn required the use of a tank mix partner to control marestail above 48% at the same evaluation time.

**SureStart - Dow AgroSciences**

SureStart is a new formulation of Surpass (acetochlor) plus Python (flumetsulam) plus Stinger (clopyralid) with a safener (dichlormid). It is expected to have limited availability in 2007 but be fully launched in 2008.

SureStart can be applied preplant, preemergence, or early postemergence in Roundup Ready and Liberty Link corn. Rates will be determined by soil type and organic matter (Table 2).

**Table 2. SureStart Rates**

<table>
<thead>
<tr>
<th>Soil Texture</th>
<th>Less than 3% OM</th>
<th>3% or greater OM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coarse</td>
<td>1.5 pt/A</td>
<td>1.5</td>
</tr>
<tr>
<td>Medium</td>
<td>1.5 - 1.75 pt/A</td>
<td>1.75</td>
</tr>
<tr>
<td>Fine</td>
<td>2 pt/A</td>
<td>2.0</td>
</tr>
</tbody>
</table>

SureStart will provide excellent control of some annual grasses, lambsquarter, pigweed, velvetleaf, nightshade, common ragweed, and smartweed; good control of cocklebur, jimsonweed, and fall panicum.

**Stout, Stout MP - DuPont**

Stout and Stout MP are pre mixes of Accent (nicosulfuron) and Harmony GT (thifensulfuron). They can be used on corn up to 16” (5 collar) tall. COC or NIS are recommended. Stout and Stout MP can be applied to corn with a relative maturity of 88 days or more. A 0.5 oz/A rate of Stout will deliver a 0.4 oz/A rate of Accent and a 0.03 oz/A of Harmony GT.

**SWEET CORN**

**Accent - DuPont**

Accent (nicosulfuron) is now labeled for fresh market sweet corn. Previously labeled for sweet corn contracted for processing, it now can also be applied to sweet corn in the fresh market. However, there is subtle differences in the application timing. The use of drop nozzles are required for sweet corn for the fresh market that is 12 to 18” tall. Applications can not be made to sweet corn either for processing or fresh market that have more than 5 collar leaves. It is always a good idea to consult your seed dealer on the sensitivity of your selected hybrid to ALS herbicides.

**SOYBEAN**

**Authority First DF - FMC**

Authority First DF, as the name might suggest, is a pre mix of Authority (62.1% sulfentrazone) and FirstRate (7.9% cloransulam-methyl). Rates will be based on soil texture and organic matter. Although Authority is gone, sulfentrazone will still be available by FMC as Spartan 4F.

**Sonic - Dow AgroSciences**

Sulfentrazone (62.1%, Authority) and cloransulam-methyl (7.9%, FirstRate) will also be available in the product Sonic. The typical use rate in Roundup Readay Soybean will be 3 oz/A. Both products will have good pre control of giant and common ragweed and lambsquarters.

**Stout, Stout MP - DuPont**

Stout and Stout MP are pre mixes of Accent (nicosulfuron) and Harmony GT (thifensulfuron). They can be used on corn up to 16” (5 collar) tall. COC or NIS are recommended. Stout and Stout MP can be applied to corn with a relative maturity of 88 days or more. A 0.5 oz/A rate of Stout will deliver a 0.4 oz/A rate of Accent and a 0.03 oz/A of Harmony GT.

**Canopy DF and Canopy EX - DuPont**

This is a return of a product that may be familiar with many producers. Canopy DF is a pre mix of Classic (10.7% chlorimuron)
and Sencor (64.3% metribuzin) and was discontinued when Canopy XL, a pre mix of Classic and Authority (46.9% sulfentrazone) replaced it on the market. Due to changes in the manufacturing and marketing of sulfentrazone, Canopy XL was discontinued a couple of years ago being replaced with Canopy EX, a premix of Classic and Express (6.8% tribenuron). Table 3 has a break down of equivalent rates for Canopy XL, Canopy EX, and Canopy DF.

<table>
<thead>
<tr>
<th>Canopy XL</th>
<th>Canopy EX</th>
<th>Canopy DF</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5 oz</td>
<td>1.1 oz</td>
<td>2.25 oz</td>
</tr>
<tr>
<td>3.5 oz</td>
<td>1.5 oz</td>
<td>3 oz</td>
</tr>
<tr>
<td>4.5 oz</td>
<td>2 oz</td>
<td>4 oz</td>
</tr>
</tbody>
</table>

*Adapted from “New Herbicides and Roundup Up Ready Corn Issues” Mark Loux, The Ohio State University

Canopy EX is labeled for the fall or at least 45 days before planting soybean. However, efforts are in works to decrease the planting restriction to 7 days before planting. This has not been changed on the label at the time of writing this article. Canopy DF can be applied in the fall or in the spring up to 45 days before planting. Read the label for soil pH restrictions when concerning rates.

The use of Canopy EX in the fall will have more common chickweed control than using Canopy DF because of the Express component. In the spring these products will provide residual control of common ragweed, lambsquarter, pigweeds and others.

Prefix - Syngenta

A co-pack of Dual II Magnum (metolachlor) and Reflex (fomesafen). Prefix is being marketed as a component in a preemergence + postemergence program. The metolachlor component will provide residual control of annual grasses, nightshade, pigweed and suppression on some other broadleaves. The fomesafen component will provide contact control of small morningglory, jimsonweed, and ragweeds.

Reflex - Syngenta

Reflex (2 lb/gal fomesafen) has a new expanded preemergence label for use as a burndown product. In Indiana the rates will be 1.5 pt/A South of I-70 and 1.25 North of I-70. Reflex has activity on common and giant ragweed, jimsonweed, pigweed, and waterhemp. Applications should be done on 4-inch or less weeds. The states of Illinois and Kansas have reported waterhemp biotypes having PPO inhibitor resistance. However, it has not been reported in Indiana at present.

Valor XLT - Valent

Valor XLT is a pre mix of Valor (30% flumioxazin) and Classic (10.3% chlorimuron). It can be applied before planting or before soybean emergence. Having flumioxazin in it, application when soybean are cracking can lead to injury. Valor XLT will control nightshade, lambsquarters, pigweed, and jimsonweed. It will be good on waterhemp, velvetleaf, and ragweeds.

ALFALFA

Prowl H2O - BASF

BASF is in the process of adding alfalfa to the Prowl H2O label. Alfalfa is presently not on the Prowl H2O label, but has been allowed on alfalfa for seed production in a few states. Rates are anticipated to be 2 to 8 pt/A in the fall or spring dormant season before 6 inches of new growth.

GRASS PASTURES

Milestone - DowAgroScience

Milestone’s active ingredient is the new compound aminopyralid (2 lb ai/gal). It is labeled in established grasses, CRP, non-crop areas, natural areas, and non-irrigations ditch banks. It can be applied at 3 to 7 fl oz/A and has no grazing restrictions.

It has been reported to work well on several thistles, including Canada and musk. It will control legumes and vetches. If you have a mixed legume grass pasture, the use of...
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Milestone will take the legumes out. It has been reported to be poor on goldenrods. There is a 1 year rotation restriction to crop land crops.

ForeFront R&P - Dow AgroSciences
ForeFront is a pre mix of Milestone (0.33 lb ai/gal aminopyralid) and 2,4-D (2.67 lb ai/A). Like Milestone it will be labeled for established grass pastures. With 2,4-D added to the mix it will have a broader weed spectrum, increasing control of some of the species, like goldenrod and wild carrot.

OTHER HERBICIDE NEWS

Metolachlor
There are several metolachlor products available on the market. Metolachlor is a member of the chloroacetamide herbicides that inhibit cell division in developing shoots. It is a preemergence herbicide known for controlling annual grasses, pigweeds, and black nightshade. Table 4 lists products containing either metolachlor or s-metolachlor, an active isomer of metolachlor.

Clethodim
Clethodim belongs to the cyclohexanediones, a group of herbicides that has activity on grassed. This group of herbicides inhibits an enzyme (carboxyltransferase) which is a component used in the making of lipids in plants. Lipids are a major component of cell membranes. Table 5 lists products containing clethodim.

RESISTANCE

ALS Resistance
ALS resistance is not a new thing to Indiana. There have been reports of ALS resistant giant and common ragweed in Indiana before (figure 2). Recently we and the Michigan State University Diagnostics Lab have identified ALS resistance in both shattercane and johnsongrass. In these situations other herbicides are effective in controlling these grasses. Glyphosate (Roundup, Touchdown, Glyphomax) is excellent in controlling both these grasses. There are also several graminacides that do an excellent job and are labeled in soybean.

Dicamba - Monsanto
Monsanto has been working on crop added value traits such as higher yields, drought tolerance, increase proteins. However in the world of weed science they have been working on a dicamba tolerant soybean. This will allow the use of dicamba, over the top of soybean. This is seen as a possible solution to the recent development of glyphosate resistant weeds such as horseweed/marestail, waterhemp, and most recently giant ragweed. Although the introduction of a dicamba resistant soybean will reduce the occurrences of injury to soybean when dicamba is used, it should be noted that other plants used as crops and ornamentals will still be sensitive. These plants include, but are not limited to, tomato, grape, and maples trees.

Optimum GAT - DuPont
Down the road from DuPont will be Optimum GAT for corn and soybean. These genetics will have glyphosate, ALS herbicide, and Liberty tolerance. Its expected release will be in 2010.

GENETICS

Dicamba - Monsanto
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**Figure 2. Field of soybean and ALS resistant ragweed.**

**Table 4. Products containing metolachlor or s-metolachlor**

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cinch, ATZ</td>
<td>DuPont</td>
</tr>
<tr>
<td>Brawl, Brawl II, ATZ</td>
<td>Tenkz</td>
</tr>
<tr>
<td>Camix</td>
<td>Syngenta</td>
</tr>
<tr>
<td>Charger Max, ATZ</td>
<td>Agrilance</td>
</tr>
<tr>
<td>Dual II Magnum</td>
<td>Syngenta</td>
</tr>
<tr>
<td>Lexar</td>
<td>Syngenta</td>
</tr>
<tr>
<td>Lumax</td>
<td>Syngenta</td>
</tr>
<tr>
<td>Me-Too-Lachlor</td>
<td>Drexel</td>
</tr>
<tr>
<td>Parallel, Parallel PCS</td>
<td>Makhteshim</td>
</tr>
<tr>
<td>Stalwart, Stalwart C</td>
<td>Sipcam Agro</td>
</tr>
<tr>
<td>Sequence</td>
<td>Syngenta</td>
</tr>
<tr>
<td>Trizmet II</td>
<td>Drexel</td>
</tr>
</tbody>
</table>

**Table 5. Products containing clethodim**

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrow 2EC</td>
<td>Makhteshim</td>
</tr>
<tr>
<td>Clethodim 2EC</td>
<td>Micro-Flo</td>
</tr>
<tr>
<td>Prism</td>
<td>Valent</td>
</tr>
<tr>
<td>Section</td>
<td>Agrilance</td>
</tr>
<tr>
<td>Select, Select Max</td>
<td>Valent</td>
</tr>
</tbody>
</table>
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Glyphosate Resistance

Glyphosate is one of the most popular herbicides in the U.S. Its efficacy, cost, and ease of use in glyphosate tolerant crops has made it popular. In 2002, Bill Johnson reported the occurrence of glyphosate resistant horseweed/marestail. During the survey for glyphosate resistance horseweed, other weeds were found to be suspect. A suspected population of giant ragweed was put under scrutiny and reported in 2006 as being resistant to glyphosate6.

ARTICLES AND PUBLICATIONS

Glyphosate Stewardship

With wide spread adoption of glyphosate and the appearance of resistance in some key agricultural pests. The Glyphosate Stewardship Working Group was formed from university weed scientists from major corn and soybean producing states who are actively involved in research and extension efforts in glyphosate-resistant cropping systems. This groups goal is to disseminate information regarding the sustainable use of glyphosate within the Midwest. Four publications have been already released and six are being produced for release in the future. For a list of publications, see table 6. To see the Glyphosate Stewardship web page go to www.glyphosateweedscrops.org.

GWC-1 and GWC-2, two new available publications on www.glyphosateweedscrops.org

Table 6. Glyphosate Stewardship Series

Available
1. Biology and Management of Horseweed
2. Biology and Management of Wild Buckwheat
3. Facts About Glyphosate-Resistant Weeds
4. Understanding Glyphosate to Increase Performance

Coming Soon
5. Using Glyphosate Wisely.
6. Economic Implications of Glyphosate Stewardship
7. Biology and Management of Giant Ragweed
8. Biology and Management of Common Ragweed
9. Biology and Management of Waterhemp
10. Biology and Management of Common Lambsquarters

To view the Glyphosate Stewardship Web site go to www.glyphosateweedscrops.org