Nov 30th, 12:00 AM

Weed Management Update - Who Cares?

Micheal D. K. Owen

Iowa State University, mdowen@iastate.edu

Follow this and additional works at: https://lib.dr.iastate.edu/icm

Part of the Agriculture Commons, and the Agronomy and Crop Sciences Commons


https://lib.dr.iastate.edu/icm/2006/proceedings/23
Weed management update – who cares?
Micheal D. K. Owen, Professor, Agronomy, Iowa State University

Introduction
Despite the importance of glyphosate-based crop systems, there is a need for continued investigation and development of new tactics to manage weeds effectively and economically. It is interesting that larger farm size and higher percentage of income attributable to grain is associated with growers willingness to accept alternative weed management strategies and the adoption of integrated weed management programs (Hammond et al. 2006). The concern for timely weed management in order to protect crop yields becomes premiere in POST-based corn and soybean systems, whether based on glyphosate or any other herbicide (Halford et al. 2001; Cox et al. 2006). Iowa State University recommends the use of herbicides that provide residual weed control in corn and soybeans. The early preplant application of residual herbicides is an excellent option to reduce weed management risks.

Consider that the it is critical to reduce application timing risk; while many growers now have sprayers and combined with the custom herbicide application industry, the approximate 22 million acres of row crops in Iowa can receive a herbicide treatment in a relatively short period of time, there is still a major risk of making a timely POST application. The risk of making a timely POST herbicide application has less to do with controlling weeds and more to do with protecting potential crop yield. Recognize that herbicide applications are at the mercy of the environmental conditions, while weeds continue to grow irrespective of the weather. Furthermore, the ability to make a timely herbicide application is dictated on the ability to assess that which is impossible to predict – when weeds begin to compete with the crop yield potential. Thus, there is still an important role for new herbicides in weed management beyond the concerns caused by the evolution of herbicide resistant weed biotypes and weed population shifts. Some of the new herbicides and weed management issues facing crop production in 2007 will discussed below.

Disclaimer
An interesting and important change that has occurred in the crop protection industry is the “reintroduction” of existing “generic” herbicides. Currently, there are many brands of many herbicides (e.g. acetochlor) offered by many companies. It is impossible to keep track of all new materials; in some cases the companies have not responded to requests for information and there is a space limitation on what can be included in publications. Thus, be it known that not all herbicide brands are included in this and other ISU publications. Lack of inclusion does not mean that that product is not a good choice, nor does inclusion mean that the product mentioned should be considered the product of choice.

Issues to consider
There are a few issues resulting from the 2006 growing season should be factored into 2007 production plans. Most of these problems are not surprisingly caused by localized environmental conditions.
Fake pesticides

While it is unlikely that manufacturers in the US, and particularly those marketed in Iowa, will be counterfeit, it is interesting to observe the report that one in 20 pesticides sold in the EU could be fake (Anonymous 2006). The European Crop Protection Association describes the counterfeit products that range from sophisticated copies of patented chemicals to low-quality fakes. In 2006, a “herbicide” used in Italy contained a potentially dangerous insecticide and in 2004, hundreds of wheat acres were destroyed by a fake herbicide in France, Italy and Spain. A survey conducted in 2002 by UK scientists found eight illegal and potentially dangerous pesticides in supermarket produce. Apparently this is an increasing and important problem. Please be aware of this as a potential problem in Iowa; if someone is selling a herbicide at a price that is too good to be true, it probably is.

Volunteer corn

Given some of the unfavorable wind conditions and stalk diseases last summer, the potential for volunteer corn in 2007 is likely to be significant in localized areas. Where harvest was difficult due to lodged or wind-damaged corn, growers should make plans to manage the anticipated volunteer corn problem.

Volunteer corn management has become more difficult than in the past. In soybeans, glyphosate has been an excellent herbicide to control volunteer corn. However, with the increasing adoption of glyphosate-resistant corn hybrids, growers have experienced problems effectively and consistently controlling volunteer corn in soybeans, even if a non-glyphosate-resistant hybrid was planted. Recognize that the glyphosate-resistant trait is transmitted via pollen. Thus, non-glyphosate-resistant hybrids may be pollinated by neighboring corn that is glyphosate-resistant resulting in an unexpected infestation of glyphosate-resistant volunteer corn.

In soybeans, the management of volunteer corn generally has more options than in corn production. The use of a DNA herbicide (i.e. pendimethalin) will help suppress volunteer corn. Furthermore, there are a number of POST products available (i.e. Select) that will effectively control volunteer corn and can be tank-mixed with glyphosate. In corn, the problem of controlling volunteer corn is difficult whether the corn or volunteer weed is glyphosate-resistant or not. Perhaps the best option may be to consider planting a glufosinate-resistant hybrid if the plan is to follow corn with corn and the previous corn hybrid was not a glufosinate-resistant hybrid. If this is not an option, and if the previous hybrid was not glyphosate-resistant and if rotation to soybeans is not possible, glyphosate will likely control most of the volunteer corn. However, pollen trespass resulting in volunteer glyphosate-resistant volunteers is still an issue. If a non-herbicide-resistant hybrid is planned, or if a glyphosate-resistant hybrid follows a glyphosate-resistant hybrid, tillage is the best and likely sole option. Consider aggressive tillage to bury the volunteer corn seeds and plan to use cultivation to remove the inter-row volunteer plants.

Herbicide carryover

The potential for herbicide carryover is predicted to be high in specific areas of Iowa. The potential for herbicide carryover is dependent on rainfall that occurred in May and June as late season rains likely had little effect on herbicide degradation. Furthermore, the timing of herbicide application and the rate of herbicides applied also significantly impacts herbicide carryover. The later the application and the higher the rate of herbicide applied, the greater
the potential for carryover. The soil characteristics will also influence the amount of carryover that the rotational crop experiences. Finally, and perhaps the most important consideration, is the rotational crop health which is a factor of the environmental conditions. If conditions are favorable for crop growth, carryover will be less of a factor than if the rotational crop is experiencing environmental stress.

Obviously, if you are rotating corn with corn or soybean with soybeans, there is little concern for herbicide carryover to the rotational crop. Also recognize that there is a difference between the ability to detect herbicide residues and herbicide carryover. The latter infers that the rotational crop is affected. Also consider that in most instances, crop yield potential is not significantly impacted by slight symptoms of herbicide carryover.

The herbicides that have the potential to carryover are typically those used in corn production and cause injury to soybeans. However, some ALS-inhibitor herbicides (i.e. Scepter) and PPO-inhibitor (i.e. Flexstar) herbicides used in soybeans have the potential to injure corn grown in rotation. Herbicides used for weed control in corn that have the potential for carryover and injure soybeans include, but are limited to atrazine, Balance Pro, Callisto (and mesotrione used in various prepackage mixtures), Impact and others.

**Future products**

Generally, products that do not have current registration are not included in Iowa State University recommendations. However, it is important to have an awareness of future opportunities, so these products, while not currently available for commercial use are described. In many instances, the companies have already issued press notification of the products. Recognize that the inclusion of these products does not constitute a recommendation for use.

**KIH-485**

ISU has conducted research with KIH-485 in collaboration with Kumiai for approximately 5 years. KIH-485 demonstrates activity on a relatively broad spectrum of weeds including woolly cupgrass and shattercane. Interestingly, KIH-485 also controls a number of broadleaf weeds such as pigweed species, common lambsquarters, and velvetleaf. KIH-485 has demonstrated activity on Asiatic dayflower. Research from Kansas State University suggests that KIH485 is more effective than some commonly used chloracetamide herbicides (Geier et al. 2006). ISU research has demonstrated that KIH-485 has exceptional residual activity and has provided consistent weed control almost regardless of environmental conditions and tillage system. KIH-485 is active at low rates and demonstrates excellent corn and soybean selectivity. It is unclear when KIH-485 will be commercially available and research continues.

**Status 56WG**

Status 56WG is a product developed by BASF that should be commercially available for corn weed control in 2007, although at the time of printing, has yet to be registered. Status 56WG is a prepackage mixture of dicamba, diflufenzopyr (Distinct) and isoxadifen (a potent safener). The mode of action for Status 56WG is on plant growth regulators (PGR) where the herbicides cause an imbalance of the hormones resulting in the death of susceptible broadleaf weeds. Research conducted by ISU demonstrates the relative crop safety of Status 56WG when compared to other PGR herbicides that do not contain the safener isoxadifen.
**GF-1885**

DowAgroSciences plan on a first quarter 2007 registration of GF-1885 and anticipate a limited launch in 2007 and a full scale product introduction in 2008. No commercial name has been announced for the prepackage mixture of acetochlor, flumetsulam and clopyralid which represents three herbicide modes of action. The crop safener dichlormid is also included in the 4.25 a.i. suspo-emulsion formulation. GF-1885 will be positioned for early season weed control in herbicide-resistant corn (glyphosate- and glufosinate-resistant hybrids).

**“New” products**

There are number of “new” products which represent previously registered herbicides that are now off patent or have been picked up by various distributors and companies for use in corn and soybeans. It is not possible to list all of these products accurately. Thus only a limited number of products are included in this section.

**Authority First/Sonic**

FMC and Dow AgroSciences have announced a long-term supply agreement where FMC will supply sulfentrazone (Authority) and Dow AgroSciences will provide cloransulam-methyl (FirstRate). The products will be marketed as Authority First and Sonic by FMC and Dow AgroSciences, respectively for weed control in soybeans. Weeds such as common waterhemp, common lambsquarters giant ragweed, and marestail will be targeted, particularly in glyphosate-resistant soybeans. The prepackage mixtures can be applied early preplant, preplant incorporated, preplant surface, preemergence and as a preplant burndown. Two herbicide mechanisms of action are included in the products; PPO inhibition (sulfentrazone) and ALS inhibition (cloransulam-methyl) and some residual control is provided.

**ET**

Nichino America, Inc. will be marketing ET 2.5% EC herbicide/defoliant. ET (pyraflufen ethyl) is a PPO inhibitor herbicide with considerable postemergence activity but without residual activity. ET is registered as a preplant burndown and post harvest herbicide in corn and soybeans and demonstrates activity on pigweed species, velvetleaf, morningglories, wild buckwheat, and field bindweed.

**Impact**

Impact herbicide (topramezone) is marketed by AMVAC for use POST use in corn. Impact is a HPPD-inhibitor herbicide and inhibits pigment synthesis. Impact is active on many annual grass and broadleaf weeds. Impact has demonstrated residual activity and may represent some risk of carryover. Note that there is an application restriction of 0.5 oz/A for Iowa north of I-80 but excluding the area that is both north of Highway 20 and west of Highway 71. South of I-80, 0.75 oz/A can be applied.

**Tenkoz Priority Herbicide**

Tenkoz Priority Herbicide is a prepackage mixture of carfentrazone-ethyl (PPO inhibitor) and halosulfuron-methyl (ALS inhibitor) registered for POST application to corn through the 8-leaf collar stage of corn development. Priority Herbicide provides control of many broadleaf weeds.
Conclusions

While there are few new herbicides available for 2007, those that are registered will potentially provide a valuable herbicide alternative for weed management in Iowa crop production systems. Recognize that while glyphosate-based crop production systems are increasingly important to Iowa, it is increasingly important to consider alternatives to supplement glyphosate for weed management. Importantly, the use of soil-applied herbicide in corn and soybean production is an excellent way to dilute the risk of untimely POST herbicide application, manage herbicide selection pressure for the evolution of herbicide-resistant weeds or weed population shifts, and importantly to consistently and effectively protect crop yields.

References


