

Dicamba Registered for Cotton

Alan York

Monsanto received EPA registration for XtendiMax with Vapor Grip Technology to be used on XtendFlex cotton and Roundup Ready 2 Xtend soybeans on November 9, 2016. Comments below pertain specifically to cotton.

The XtendiMax label for cotton can be found at <https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OPP-2016-0187-0958&disposition=attachment&contentType=pdf>

This was a conditional registration, or a time-limited registration, and will expire on November 9, 2018 unless the EPA determines before that date that off-target incidents are not occurring at unacceptable frequencies. At that scheduled expiration date, the EPA can amend the label in any way they deem necessary, and they can extend registration to no later than November 9, 2021. The registration will automatically expire on November 9, 2021 unless the EPA determines prior to that date that herbicide resistance to dicamba is not occurring at unacceptable frequencies and that off-target incidents are not occurring at unacceptable frequencies. In other words, if we have a lot of off-target issues or if resistance to dicamba becomes an issue, we could lose the registration.

XtendiMax is a single active ingredient product. It contains only dicamba, as the diglycolamine salt, and Vapor Grip. Vapor Grip is a proprietary ingredient; Monsanto will not disclose what it is although they have explained the mechanism by which it works. Vapor Grip basically keeps the dicamba in a less volatile state.

Dicamba is commercially available primarily as two salts although a few products containing dicamba acid are available. The dimethylamine salt (DMA salt) is what is in Banvel and some generic products, and of course Banvel has a reputation for being volatile. The other salt is a diglycolamine salt (DGA salt), which is in Clarity and some generics. Dicamba DGA salt is much less volatile than dicamba DMA salt. The Vapor Grip technology further reduces volatility.

BASF is anticipating registration before the 2017 use season for Engenia. Engenia contains the BAPMA salt of dicamba, and company data show that the BAPMA salt is less volatile than the DGA salt. I am unaware of any data on a direct comparison of volatility of XtendiMax with Vapor Grip and Engenia. And, there is a possibility that Monsanto will receive registration for Roundup Xtend before the 2017 growing season. Roundup Xtend will contain glyphosate, dicamba, and Vapor Grip.

Only brands of dicamba specifically registered for use on XtendFlex cotton (currently only XtendiMax) can be used in-season, or postemergence, on XtendFlex cotton. I doubt no one will claim that XtendiMax with Vapor Grip is completely non-volatile, but use of this formulation should greatly reduce vapor drift as a cause of off-target sensitive crop injury.

Time of application and rates – Preplant or preemergence. XtendiMax with Vapor Grip can be applied preplant, at planting, or postemergence. For preplant or preemergence application, a maximum of 44 fl oz can be applied per season. As I interpret the label, that could be 22 oz applied twice or up to 44 oz applied once.

We have been recommending, and will continue to recommend, dicamba or 2,4-D as a component of burndown programs to aid in the management of glyphosate-resistant horseweed, cutleaf eveningprimrose, wild radish, and other weeds not adequately controlled by glyphosate. There are waiting periods between application and planting (21 days plus rainfall for dicamba; 30 days for 2,4-D).

Some growers perennially have difficulty getting their burndown on early enough to meet these waiting requirements. XtendiMax herbicide and XtendFlex cotton will give those growers more flexibility -- there is no waiting period between XtendiMax application and XtendFlex cotton planting. Potentially, one could do his "preplant" burndown and plant on the same day. That extra flexibility in application timing can be helpful, but I hope growers do not abuse that. For various reasons, I think we need to continue to put our burndown on well in advance of planting. The exception may be where we have a good cover crop and we want to accumulate more biomass before terminating the cover crop.

Cover crops are becoming more widely planted, and often grass/legume mixtures are being promoted by the Soil Conservation Service. Legumes, such as clover or vetch, can sometimes be difficult to kill. We generally recommend dicamba plus glyphosate to kill legume cover crops. Xtendimax herbicide and XtendFlex cotton will allow us to let the cover crop grow a little longer and still get a good kill. But again, we don't need to wait until the day we plant to kill that cover.

Let's clarify a point concerning dicamba and burndown. Any brand of dicamba registered for burndown application can be used in that manner on any variety of cotton. However, one must follow the specific product's label for burndown use. Hence, for products other than XtendiMax, the current requirement for application at least 21 days ahead of planting remains, even if one is planting XtendFlex cotton. XtendiMax can be applied to XtendFlex cotton anytime prior to planting or immediately after planting. Regardless of the brand of dicamba (i.e., even if one is using XtendiMax), the current restriction for application at least 21 days before planting plus rainfall still applies on any cotton that is not XtendFlex. Any brand of dicamba, including XtendiMax, applied at or near planting of non-XtendFlex cotton will cause injury.

What about residual control from dicamba? Should we ever consider dicamba preemergence? Dicamba can give short-term (10 to 14 days) residual control of broadleaf weeds. However, it is inconsistent. Interestingly, we see residual activity under conditions opposite of what we see with typical preemergence herbicides. With little to no rainfall, the residual control can be pretty impressive. On the other hand, we see no residual control under rainfall conditions that make other herbicides work. Because of the inconsistency in control and the short period of control, and because we need to keep resistance management in mind, I will not recommend dicamba PRE per se. However, there may be specific situations where a preemergence application is warranted. An example would be glyphosate-resistant horseweed that was not adequately controlled earlier or a new flush of horseweed.

Time of application and rates – Postemergence. XtendiMax can be applied in-crop from cotton emergence up to 7 days prior to harvest. The minimum and the maximum rate for a single in-crop postemergence application is 22 fl oz (0.5 lb a.e./acre). The combined total of all applications (preplant, preemergence, postemergence) cannot exceed 88 fl oz of XtendiMax or 2.0 lb a.e. dicamba from all sources. If no dicamba is used preplant or preemergence, one could potentially make four postemergence applications per season. For reasons of resistance management and limiting potential for off-target deposition, I would like to see growers restrict their use of dicamba postemergence to two applications per year, and I hope growers will avoid applications later in the season. With a good total system (strong preemergence program, timely postemergence with residuals), one dicamba application will often be adequate. XtendiMax applications must be separated by at least 7 days.

Weed size. The XtendiMax label specifies in-crop application to weeds 4 inches or less in height. I have done enough work with dicamba to know that control decreases as weeds become larger. And, I have seen a number of growers who were very disappointed when applying dicamba to knee-high weeds. I am concerned that growers may relegate XtendiMax to salvage situations. Although we have seen

surprisingly good control of larger Palmer amaranth with multiple applications of Liberty plus dicamba, that is a practice we need to avoid. Not only can we lose yield due to competition before beating the weeds down, but such a practice can set us up for resistance evolution.

Tank mixes. The XtendiMax label currently prohibits tank mixing anything with XtendiMax. The restriction comes because of the potential of another product mixed with XtendiMax to affect physical properties of the spray solution such that smaller spray droplets (increased drift potential) are formed.

Tank mixes are needed for two reasons. First, a mixture of glyphosate plus dicamba or glufosinate plus dicamba is typically more effective on weeds than dicamba alone. Also, we have become accustomed to applying a residual herbicide such as Dual Magnum or Warrant postemergence to extend residual control further into the season. The second reason we need tank mixes is for resistance management (specifically, avoiding resistance). Tank mixing two or more herbicides having different mechanisms of action but activity on the same species is a well-established resistance management tactic.

The restriction on tank mixes is a serious limitation, and hopefully tank mixes will be allowed at some point in the future. Before a tank mix can be approved, some very specific experiments must be conducted to determine the impact of the tank mix partner on spray droplet size. The EPA is requiring Monsanto to maintain a website (website is listed on the XtendiMax label) which lists all the approved tank mixes. The XtendiMax label states that the user must check that website no more than 7 days before applying XtendiMax.

Adjuvants. The above restriction on tank mixes also applies to adjuvants, including drift reduction agents. Before using any adjuvant, one must check with the website.

A very important restriction is that no adjuvant containing ammonium salts, such as ammonium sulfate or urea ammonium nitrate, can be used with XtendiMax. Ammonium salts greatly increase the volatility of dicamba.

Application parameters. No aerial application of XtendiMax will be allowed. Currently, the XtendiMax label specifies use of only TeeJet TTI11004 nozzles with a maximum operating pressure of 63 PSI. Other nozzles may ultimately be allowed; if so, approved nozzles will be listed on the website. The label requires application in a minimum of 10 GPA, and limits sprayer speed to a maximum of 15 MPH. The label limits boom height to a maximum of 24 inches above the target weed or crop canopy. Wind speed obviously affects spray drift. The XtendiMax label states that optimum wind speeds are 3 to 10 MPH. The label prohibits application when wind speed is less than 3 MPH or greater than 15 MPH.

Buffers. To protect Threatened and Endangered (TE) Species, the XtendiMax label specifies a downwind buffer of 110 feet when applying 22 fl oz of product or 220 feet when applying 44 oz. The following may be included in calculation of the buffer distance: roads, areas covered by the footprint of a manmade structure with walls or roof, agricultural fields prepared for planting, and planted agricultural fields containing XtendFlex crops, corn, sorghum, or small grains. Pastures are apparently not allowed as part of the buffer. The EPA assumes that all areas other than those specified above contain TE species.

Compliance with this buffer will be relatively easy in large, regularly shaped fields. Small fields and fields that look like a piece of a jigsaw puzzle will be problematic. In many of our fields, I am not convinced we can practically comply with the buffer.

The 110-foot or 220-foot buffer specifically applies to “sensitive areas” where TE species might be present. In terms of non-target susceptible crops, the label does not mention specific buffer distances. The label simply says “do not apply under circumstances where off-target movement may occur to food,

forage, or other plantings that might be damaged or the crops thereof rendered unfit for sale, use, or consumption.” Additionally, the label states “do not apply when the wind is blowing toward adjacent commercially grown dicamba-sensitive crops.” No distances are specified. The label further states that “before making an application, the applicator must survey the application site for neighboring non-target susceptible crops. Applicators are required to ensure that they are aware of the proximity to non-target susceptible crops”, and that “the applicator must consult sensitive crop registries.” The bottom line is that prevention of off-target deposition is the responsibility of the applicator.

Resistance management. The label has language concerning resistance management. Specifically, it mentions diversification in management programs, including multiple herbicides with different mechanisms of action and overlapping spectrums of control, soil-applied herbicides, full labeled rates, cultural practices, and management of weeds around fields and after crop harvest to reduce seed production. Extension has already been promoting such resistance management practices.

The label states that one should scout fields before application to ensure herbicides and rates will be appropriate for the weed species and weed sizes. And, the label instructs the user to scout fields after application to detect escapes.

Incidences of non-performance (escapes) should be reported to Monsanto. The EPA has put the onus of tracking and “fixing” resistance on Monsanto. Monsanto must visit the site to determine if “likely herbicide resistance” is present. The EPA requires that Monsanto obtain samples of likely resistant weeds or seeds and conduct testing to confirm presence or absence of resistance. Monsanto must “proactively engage with the grower to control likely resistant weeds”. And, Monsanto must follow-up with the grower to determine if likely resistant weeds have been controlled.