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## Precautions for Dicamba Use in Xtend Soybeans

Bill Johnson – Joe Ikley – Aaron Hager – Mark Loux

### Dicamba use in soybean - general information

Ohio, Indiana, and Illinois are heavily infested with weeds resistant to glyphosate (group 9), PPO inhibitors (group 14), and ALS inhibitors (group 2). This has greatly reduced the number of effective postemergence herbicides for controlling these weeds in Roundup Ready 2 (RR2) soybeans. Adoption of Roundup Ready 2 *Xtend* (glyphosate and dicamba resistant – RR2 Xtend) soybeans and use of dicamba-based herbicides is one option for managing resistant weed populations. Keep in mind that selection for dicamba resistance occurs each time dicamba is applied, and over reliance on this technology will lead to the development of dicamba-resistant weed populations.

Concurrent with the development of dicamba-resistant soybean varieties, Monsanto and BASF developed new formulations of dicamba herbicides for use in RR2 Xtend soybeans that are supposed to be lower in volatility compared with previous dicamba products. These products are Xtendimax (Monsanto), FeXapan (same thing as Xtendimax, but sold by DuPont), and Engenia (BASF). The federal labels for these herbicides contain very detailed application instructions to reduce risk of off-target movement. However, in 2017, there were thousands of cases of off-target movement affecting millions of acres throughout the soybean growing region of the US. As a result, we provide information here to help reduce risk of off-target movement of dicamba applied to RR2 Xtend varieties. The information provided here is not necessarily inclusive, or meant to replace a thorough knowledge of herbicide labels and other information provided by manufacturers.

In early October 2017, the EPA approved revised labels for Xtendimax, FeXapan, and Engenia. All three products are now restricted use pesticides, meaning an applicators license must be held in order to purchase and apply these products. The labels now also require applicators to attend an annual dicamba or group 4 herbicide-specific training prior to using the products. In addition to becoming restricted use pesticides, these revised labels have more restrictions outlining how the products should be applied. The language regarding buffers and applications near sensitive crops has also been rewritten for clarification on what constitutes sensitive areas and crops, and how the products should be applied.



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## Important label restrictions

1) **Use only approved dicamba products** - As of early November 2017, there were only three dicamba-containing products approved for preplant, preemergence, or postemergence use in Roundup Ready Xtend soybeans. The approved products are Xtendimax, FeXapan, and Engenia. It is a violation of federal and state law to use anything but approved formulations of dicamba on Roundup Ready Xtend soybeans. Other dicamba products can be used at least 14 days preplant, if the appropriate waiting interval is followed per the label for non-Xtend soybeans.

2) **Wind direction** – The labels state that a buffer is required if wind is blowing towards a sensitive area, and that dicamba should not be applied at all if the wind is blowing toward a sensitive crop. In 2017, it appeared that many applicators did not follow this restriction, perhaps because a specific distance to the sensitive area was not specified and sensitive areas and crops were not well defined. Realistically, if the sensitive crop is within a 0.5 mile or less of the target field, common sense would suggest it might not be a good idea to apply to that field. If wind is blowing towards extremely sensitive vegetation, such as non-Xtend soybean varieties, we recommend not to spray until the wind is blowing away from the sensitive crop on the day of application, and also for the next 2 to 3 days after application.

3) **Wind speed** - The labels allow spray applications when wind speeds are between 3 and 10 mph, and these wind speeds are to be measured at the boom height. This is more restrictive than in 2017 when applications could be made when wind speeds were up to 15 mph, depending on the product used. In 2017, a key aspect overlooked by many was the speed of wind gusts, and many applicators may have focused more attention on average wind speed rather than wind gust speed. As a result, many spray applications were made during days when average wind speeds were less than 15 miles an hour, but in many instances wind gusts were in excess of 15 miles an hour. We strongly recommend not applying on days when wind gusts exceed 10 miles an hour even if sustained wind speeds are less than 10 miles an hour. It is not always easy to find a window with these lower wind speeds. The reality is that some years can be challenging to make applications of dicamba products that have very strict label precautions with regard to wind.

4) **Time of day** – The labels now allow applications to be made only between sunrise and sunset. This is to restrict applications to when temperature inversions are less likely to occur. If the time of day restriction was in place in 2017, there would have been substantially fewer hours in June where applications could be made. Accounting for conditions that allowed equipment traffic, West Central Indiana would have had only 48 hours in June with wind speeds between 3 and 10 mph between the hours of sunrise and sunset.



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5) **Temperature inversion** - During a temperature inversion, very small spray droplets remain suspended in the air and do not settle on plants or the soil surface. These droplets will move when wind speed increases later in the day. We strongly recommend that you use an app like Spray Smart or something similar to determine whether or not a temperature inversion exists. If there is a temperature inversion, do not spray until the inversion has lifted.

6) **Buffers** - Another frequent violation of the label in 2017 was failure to implement buffers near sensitive areas. Many applicators took the approach that if the wind was blowing away from the sensitive crop, dicamba could be applied right up next to the sensitive crop. University research in 2017 demonstrated that even the new formulations of dicamba can volatilize and move on dust particles for up to three days following application. Wind directions can change on day two or day three and move volatilized dicamba or dicamba dust to sensitive vegetation. So the establishment of buffers is extremely important if you are near a sensitive area.

7) **Nozzles** - Consult the websites for the respective herbicides to find the list of approved nozzles and spray pressures to apply the approved dicamba products to Xtend soybeans.

8) **Spray additives and tank-mix partners** - The list of approved spray additives changes frequently, so it is important to regularly check the websites. All approved dicamba products require the use of a drift control agent from the list of approved drift control agents on their respective website. The addition of any other product, including foliar fertilizers, insecticides, herbicides, or fungicides, that is not listed on the website for the respective herbicide constitutes a label violation. Finally, do not add ammonium sulfate or anything containing ammonium sulfate as this produces more of the volatile form of dicamba. There are approved non-ammonium sulfate based water conditioners to reduce hard water antagonizing glyphosate that is tank-mixed with an approved dicamba formulation.

### Websites for the approved dicamba products:

[www.engeniatankmix.com](http://www.engeniatankmix.com)

[www.xtendimaxapplicationrequirements.com](http://www.xtendimaxapplicationrequirements.com)

[www.fexapanapplicationrequirements.dupont.com](http://www.fexapanapplicationrequirements.dupont.com)

### Additional suggestions to reduce offsite movement

The following are a number of additional suggestions to implement if you are concerned about offsite movement. Keep in mind that one can do everything “per the label” but still have offsite movement. This happens because: 1) even these new dicamba formulations have the capability of volatilizing and moving on dust particles; 2) fine spray particles can remain



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suspended in inversions; and 3) and dicamba can move with runoff water after heavy rainfall events. To reduce the probability of both primary and secondary dicamba movement events, consider the following recommendations:

1) Do not spray when the forecast indicates wind gusts will exceed 10 mile per hour. It is impossible to predict when a gust of this magnitude will happen nor how long it will last. Gusts that reach 30 mph can move spray particles and vapor for great distances.

2) Reduce boom heights to the extent practically possible, in order to get close to the 24- inch boom height limit specified on the label. Simply reducing the boom height from 48 to 24 inches has been shown to reduce the distance traveled by drift particles by 50%. One of the most effective ways to safely lower the boom height without running the boom into the ground is to reduce sprayer travel speed. Also remember that any travel speed over 15 mph is off-label. The labels also now recommend that travel speeds be reduced to 5 mph when making applications on the field edges.

3) Avoid application when temperature exceeds 80 degrees. Assuming that these dicamba products have some potential for volatility, the risk of this occurring increases with temperature.

4) Consider applying dicamba only preplant, preemergence, or very early postemergence. Over 90% of the offsite movement complaints resulted from postemergence applications. Our assumption is that applications earlier in spring will have less likelihood to cause problems even where dicamba moves, due to the absence in many cases of any developed vegetation to injure. Temperatures are also likely to be lower when applied preplant/preemergence versus postemergence, possibly reducing the risk of movement via volatility.

5) Have conversations with neighbors to know what crops and technologies are being planted around Xtend soybean fields. Many offsite movement cases in 2017 occurred where neighbors planted Xtend and non-Xtend soybean adjacent to each other. Knowing what sensitive crops are in the vicinity of your Xtend fields will enable better decision-making about use of dicamba in a given field.

**Find the latest weed management information and tools from Purdue:**

**<https://ag.purdue.edu/btny/weedscience>**

**Find the latest weed management information and tools from Ohio State:**

**<https://u.osu.edu/osuweeds/>**

**Find the latest weed management information and tools from Illinois:**

**<http://extension.cropsciences.illinois.edu/fieldcrops/weeds/>**