



Precautions for Using Dicamba Herbicides in Xtend® Soybeans

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Dicamba-resistant Soybeans

Ohio, Indiana, and Illinois are heavily infested with weeds resistant to glyphosate (group 9), PPO inhibitors (group 14), and ALS inhibitors (group 2). This resistance has greatly reduced the number of effective postemergence herbicides that can control these weeds in Roundup Ready 2® (RR2) soybeans. One option for managing these resistant weeds is to adopt Roundup Ready 2 Xtend® soybeans (RR2 Xtend). This crop is resistant to glyphosate and dicamba, which allows growers to apply dicamba-based herbicides to control herbicide-resistant weed populations.

However, growers must take certain precautions when using this technology to avoid further herbicide resistance and drift issues. This publication describes some of the issues associated with dicamba applications and how growers can manage them. The information we provide does not necessarily provide all information about this topic, nor should this publication replace an applicator's thorough knowledge of herbicide labels and other information that the manufacturers provide.

Along with developing dicamba-resistant soybean varieties, Monsanto and BASF developed new formulations of dicamba herbicides for use in RR2 Xtend® soybeans. These formulations are supposed to have lower volatility than previous dicamba products. The herbicide products are XtendiMax® (Monsanto), FeXapan® (same thing as XtendiMax®, but sold by DuPont), and Engenia® (BASF).

The federal labels for these herbicides provide very detailed application instructions to reduce the risk of off-target movement. However, in 2017 there were thousands of cases of off-target movement that affected millions of acres throughout the soybean growing region of the United States.

New Product Labels

In early October 2017, the EPA approved revised labels for XtendiMax®, FeXapan®, and Engenia®. The labels include several key changes.

First, all three products are now restricted use pesticides, which means that you must hold an applicator license to purchase and apply these products.

Second, the revised labels also require applicators to attend annual dicamba or group 4 herbicide-specific training before using these products.

Third, the revised labels include additional restrictions that outline how the products should be applied.

Fourth, the label language regarding buffers and applications near sensitive crops clarifies what constitutes sensitive areas and crops, and how the products should be applied.



Important Label Restrictions

Here are eight important restrictions that are now imposed on all three dicamba products.

- 1. Use only approved dicamba products.** As of early November 2017, there were only three dicamba-containing products that have been approved for preplant, preemergence, or postemergence use in Roundup Ready Xtend[®] soybeans: XtendiMax[®], FeXapan[®], and Engenia[®]. It is a violation of federal and state law to use anything but these approved dicamba formulations on Roundup Ready Xtend[®] soybeans. You can use other dicamba products at least 14 days before planting if you follow the appropriate waiting interval according to the herbicide label for non-Xtend soybeans.
- 2. Monitor wind direction.** The herbicide labels state that a buffer is required if the wind is blowing toward a sensitive area, and that the products cannot 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 the labels didn't specify a specific distance to the sensitive area and sensitive areas and crops were not well defined. Realistically, if a sensitive crop is within a 0.5 mile of the target field, common sense suggests it is not a good idea to apply to that field. If wind is blowing toward extremely sensitive vegetation (such as non-Xtend soybean varieties) we recommend that you do not spray until the wind is blowing away from the sensitive crop not just on the day of application, but also for the two to three days after application.
- 3. Measure wind speed.** The herbicide labels allow applications when the wind speed (measured at boom height) is between 3 and 10 mph. This is more restrictive than in 2017 when applications could be made with wind speeds up to 15 mph. In 2017, many applicators overlooked the speed of wind gusts. As a result, they made many spray applications when the average wind speed was within acceptable limits, but wind gusts were often greater than the upper limit. We strongly recommend that you do not apply these products on days when wind gusts exceed 10 mph even if sustained wind speeds are less than 10 mph. It is not always easy to find a window with these lower wind speeds. The reality is that some the very strict label precautions about wind will make it challenging in some years to make any applications of these dicamba products.
- 4. Apply at specific times of day.** The herbicide labels now specify that all applications must be made between sunrise and sunset. This is to restrict applications to times when temperature inversions are less likely to occur. If this restriction was in place in 2017, there would have been substantially fewer hours in June when 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.



5. Be alert for temperature inversions. During a temperature inversion, very small spray droplets of herbicide remain suspended in the air and do not settle on plants or the soil surface. These droplets will move when the wind speed increases later in the day. We strongly recommend that you use a smartphone app like Spray Smart to determine whether a temperature inversion exists. Do not spray until the temperature inversion has lifted.

6. Observe buffers. Another frequent violation of the label in 2017 was that applicators failed to implement buffers near sensitive areas. Many applicators took the approach that if the wind was blowing away from the sensitive crop, they could apply dicamba right up next to the sensitive crop. University research in 2017 demonstrated that even the new dicamba formulations 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, it is extremely important to establish buffers if you apply near a sensitive area.

7. Use approved nozzles. Consult herbicide websites for lists of approved nozzles and spray pressures to apply the approved dicamba products to Xtend® soybeans.

8. Use only approved spray additives and tank-mix partners. The list of approved spray additives changes frequently, so it is important to regularly check

product websites. All approved dicamba products require using a drift control agent from a list of approved drift control agents listed on each product's website. Adding any other product (including foliar fertilizers, insecticides, herbicides, or fungicides) that is not listed on the herbicide product's website constitutes a label violation. Never add ammonium sulfate or anything containing ammonium sulfate to these herbicides, because it will make the dicamba more volatile. There are approved non-ammonium sulfate based water conditioners to reduce hard water antagonizing glyphosate that is tank-mixed with an approved dicamba formulation.

Product Websites

For more information about these dicamba herbicides (including approved nozzles and additives), consult the product website.

Engenia®
www.engeniatankmix.com

XtendiMax®
www.xtendimaxapplicationrequirements.com

FeXapan®
www.fexapanapplicationrequirements.dupont.com



More Suggestions to Reduce Off-site Movement

In addition to the label restrictions, we have a number of suggestions you should implement if you are concerned about off-site movement. Keep in mind that you can do everything “per the label” but still have off-site movement. This can still happen because:

- Even these new dicamba formulations have the capability of volatilizing and moving on dust particles
- Fine spray particles can remain suspended in inversions
- Dicamba can move with runoff water after heavy rainfall events

To reduce the probability of both primary and secondary dicamba movement events, consider these recommendations:

- 1. Do not spray when the forecast indicates wind gusts will exceed 10 mph.** It is impossible to predict when a gust of this magnitude will happen or 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) 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 that drift particles travel by 50 percent. 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 greater than 15 mph is off-label. The labels now recommend that you reduce travel speeds to 5 mph when applying on field edges.

- 3. Avoid applying when the temperature exceeds 80 degrees.** Assuming that these dicamba products have some potential for volatility, the risk of volatility increases with temperature.
- 4. Consider applying dicamba only preplant, preemergence, or very early postemergence.** More than 90 percent of the off-site movement complaints in 2017 resulted from postemergence applications. Our assumption is that applications earlier in spring are less likely to cause problems even where dicamba moves, because (in many cases) there is little developed vegetation to injure. Temperatures are also likely to be lower when applied preplant/preemergence versus postemergence, which could possibly reduce the risk of movement via volatility.
- 5. Talk with neighbors to know what crops and technologies are being planted around Xtend[®] soybean fields.** Many off-site 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.