

## Preharvest Treatment Options for Dry Edible Beans

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“Green” weeds not controlled by earlier weed management practices and “green” stems or leaves of dry bean plants can be a major problem for growers who are trying to direct harvest. Preharvest herbicide treatments to desiccate green tissue can help reduce harvesting issues. In Michigan, there are four different herbicide options that can be used for preharvest treatments in dry beans. These products are Gramoxone Inteon 2SL (paraquat), glyphosate (several formulations), Aim 1.9EW (carfentrazone), and Valor 51WG (flumioxazin). Valor just recently received a registration as a preharvest treatment in dry beans. Depending on your cropping situation, one of these herbicides may be more beneficial than the others based on their intended use and label restrictions. Below are benefits and additional use precautions that should be considered when choosing a preharvest treatment.

*Gramoxone Inteon 2SL* (paraquat) was one of the first products registered as a harvest aid in dry beans. The primary use of Gramoxone Inteon is to desiccate uncontrolled weeds that may interfere with harvest. However, Gramoxone Inteon will also help desiccate dry beans that may have some green leaves or stems. In MSU trials, Gramoxone Inteon has been the herbicide with the quickest speed of activity, showing greater control of weeds and desiccation of dry beans at 3 days after treatment. However, by 7 days after treatment dry bean desiccation with Valor and 14 days after treatment weed control and dry bean desiccation with glyphosate (Roundup) have been similar to Gramoxone Inteon. Gramoxone Inteon is a contact herbicide so desiccation is dependent on good spray coverage. The *use rate* of Gramoxone Inteon is 1.2 to 2 pt/A.

In MSU trials we have generally applied **2 pt/A**. A non-ionic surfactant (**NIS**) at 0.25% v/v must be applied with Gramoxone Inteon. The application timing for Gramoxone Inteon is when the dry bean crop is mature, at least **80%** of the **pods** should be **yellowing** and mostly ripe and no more than 40% (bush-type beans) or 30% (vine-type beans) of leaves still green. Gramoxone Inteon can be applied as a split application if weed and dry bean growth is lush and vigorous, but the total application rate cannot exceed 2 pt/A. There is a **7 day preharvest restriction** between application of Gramoxone Inteon and dry bean harvest. Gramoxone Inteon is also a **restricted-use pesticide**, so a private or commercial pesticide applicator's license is required for use of this product.

**Glyphosate** (several formulations) should **only** be used to **control weeds** that hinder harvest and **not** for dry bean **vine desiccation**. Glyphosate is the most effective herbicide for broad-spectrum weed desiccation followed closely by Gramoxone Inteon of the herbicides labeled for preharvest application. Glyphosate is a systemic herbicide so it generally takes 10 to 14 days after application for maximum activity. Glyphosate should only be applied when beans are in the **hard dough stage (30% moisture or less)**. Earlier applications have resulted in glyphosate residues found in harvested beans. There is a **7 day preharvest restriction** between glyphosate application and dry bean harvest and only one glyphosate application should be made per year. Glyphosate should not be applied to beans grown for seed or to plants where vines or hay may be used to feed livestock. There are several glyphosate formulations that are labeled for preharvest treatments in dry beans, it is important to examine the individual product labels to make sure a particular glyphosate formulation is labeled for this use. The maximum use rate of glyphosate is **0.75 lb ae/A**, which is equivalent to 22 fl oz/A of Roundup WeatherMax and Roundup PowerMax or 24 fl oz/A of Durango DMA or 32 fl

oz/A of a 3 lb ae/gal glyphosate formulation. Ammonium sulfate (*AMS*) at 17 lb/100 gal should always be added, regardless of glyphosate formulation.

*Valor 51WG* (flumioxazin) is the newest herbicide labeled as a preharvest treatment in dry beans. Valor has provided similar desiccation of dry beans as Gramoxone Inteon, by 7 days after treatment in several MSU trials. However, weed control has not been quite as effective. There is not an initial application timing listed on the label, but I would recommend using similar guidelines as Gramoxone Inteon. These guidelines are when the dry bean crop is mature, at least 80% of the pods are yellowing and mostly ripe and no more than 40% (bush-type beans) or 30% (vine-type beans) of leaves still green. Valor should be applied at 1.5 to 2.0 oz/A with 1 qt/A of a methylated seed oil (MSO) or crop oil concentrate (COC). In MSU trials, *1.5 oz/A* of Valor with *MSO* has provided similar desiccation as 2 oz/A of Valor. Dry beans can be harvested within *5 days* of application, but in MSU trials it generally takes 7 to 14 days after treatment to reach maximum dry bean desiccation. Depending on your crop rotation, the *residual activity* of Valor activity can be a draw back or benefit. If your intended rotation is corn or soybean Valor can provide some residual control of winter annual weeds prior to planting these crops. However, if you are planning on planting *winter wheat* after a desiccation application of Valor there needs to be *1 month* and *1-inch of rain* before planting this crop. For sugar beets the rotation restriction was just changed to 4 months if the soil is tilled and 8 months if the soil is not tilled with a maximum application rate of 2 oz/A of Valor. However, we have not examined these new rotation restrictions in Michigan and I would recommend not using Valor as a desiccation treatment if you are intending to plant sugar beets the following spring. Another thing to keep in mind is Valor residues can many times be trapped in poly-tanks and hoses in sprayers if not adequately cleaned. There are special sprayer cleanup procedures listed on the label. It

is important to follow these procedures, so there is not a problem with tank-contamination in the following spray loads.

*Aim 1.9EW* (carfentrazone) has consistently been the *least effective* preharvest herbicide for weed and dry bean desiccation in MSU trials. However, if this is the herbicide that you choose to use there are a few guidelines that need to be followed. The application timing is similar to Gramoxone Inteon. These guidelines are to apply Aim when the dry bean crop is mature, at least **80%** of the  *pods are yellowing* and mostly ripe and no more than 40% (bush-type beans) or 30% (vine-type beans) of leaves still green. The *Aim use rate* is **1 to 2 fl oz/A** and Aim should be applied with 1% v/v MSO. The *preharvest interval* for Aim is **3 days**.