

Preharvest herbicide applications in dry edible beans *Caution needs to be taken to avoid illegal residues*

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Preharvest herbicide applications in dry edible beans have become more popular as growers switch to direct harvesting techniques. Herbicides used prior to harvest, also known as “*Harvest Aids*”, are used to desiccate or dry down “green” stem and leaf tissue that can hinder dry bean harvest. The main intention of preharvest herbicide applications is to desiccate weeds; however many growers are using these herbicide applications to hurry along or even out the maturing process of dry beans. Currently in Michigan there are five different herbicide options labeled for preharvest applications in dry beans. These herbicides are Gramoxone Inteon 2SL (paraquat and other formulations), Valor 51WG (flumioxazin), Aim 1.9EW (carfentrazone), glyphosate (Roundup and several other formulations), and the recently registered product Sharpen 2.85L (saflufenacil). Differences in these products include the speed of activity, recropping restrictions, and effectiveness. But more importantly if not used properly one of these herbicides, glyphosate, can lead to illegal herbicide residues in the marketed product. Additionally, the newest registered product *Sharpen does not yet have clearance for use on dry edible beans being exported outside of North America*. While we have had good results with Sharpen as a harvest aid in our research plots over the last several years, we are currently *not recommending* the use of Sharpen until MRLs (maximum residue levels) are established for the export market; since much of Michigan’s dry edible bean crop is exported. Maximum residue levels (MRLs) for export outside North America should be established before the 2012 dry bean harvest.

As mentioned earlier, caution needs to be taken if using glyphosate as a harvest aid. Over the last several years there have been an increasing number of reports of exported dry beans being rejected from buyers due to illegal glyphosate residues in the shipped product. Glyphosate residues can be found in dry beans if the glyphosate label is not followed and applications occur prior to the *hard dough stage (30% moisture or less)*. This coupled with the extreme sensitivity of current residue testing equipment makes the detection of small amounts of herbicide residues exceedingly easy in exported products. If residues are detected above acceptable levels this can render exported product shipments worthless and can put future roadblocks in the exportation of Michigan dry beans. While the intentions of most growers are to make these applications according to the label, the unevenness in dry bean maturity of some varieties makes it difficult to have an entire field all at the same stage for preharvest herbicide applications. In these cases, growers should either wait until the entire field of dry beans is in the hard dough stage (30% moisture or less) or they should consider using a different product. Remember

there is also a 7 day preharvest interval for glyphosate. Below are the benefits and additional use precautions for herbicides that can be used instead of glyphosate as a preharvest herbicide application in dry beans.

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.

Valor 51WG (flumioxazin) 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). 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 sugarbeets the rotation restriction is 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. There have been some concerns with the rotation restriction prior to planting sugarbeet. We are currently in our second year of a replant study examining this concern. Until we have the second year of sugarbeet harvest results available, I would caution growers on using Valor as a desiccation treatment if you are intending to plant sugarbeets the following spring. Another thing to keep in mind is Valor residues can be trapped in poly-tanks and hoses if the spray equipment is 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***.

Combinations of different preharvest herbicides: Several growers have felt that they have had better results with combinations of the aforementioned harvest aid products. In MSU trials we have rarely observed a benefit to some of these combinations. However, if one chooses to use a combination of any of these products it is important to follow use precautions of the most restrictive product.