Herbicide Shortage – How To Plan For The 2022 Growing Season

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Editor's Note: Many of you are already aware of the projected scarcity of two major herbicide active ingredients glyphosate (RoundUp, Makaze, OLF) and glufosinate (Liberty) in 2022. Industry sources are suggesting that glyphosate and glufosinate stocks will both be reduced by at least 20% in 2022 compared to 2021 and, at least in the case of glyphosate, may not be available until July. Supply challenges and price increases are also anticipated for other inputs, especially phosphorous fertilizers, for next season and will be addressed in future Produce Pages articles. The following article is focused on field crops, especially no-till corn and soy, but the strategies to adapt to scarcer and more expensive glyphosate may be helpful to growers in the Eastern New York region as well.

There is a lot of speculation about a herbicide shortage for the 2022 growing season, which will impact weed management decisions starting with fall applications. The two main active ingredients that we're hearing about right now are glyphosate (Roundup, others) and glufosinate (Liberty, others), both associated with an increase in cost. There will likely be limited supplies of other pesticide active ingredients as well, but in the short term, a shortage of these two active ingredients poses some major challenges for corn and soybean production. The purpose of this article is to discuss ways to minimize the impact of herbicide shortage on corn and soybean production in the Midwest. As you search for alternatives to these two herbicides you may have already determined that weed control guides produced by University Extension and Industry will become your most important tool for planning your herbicide purchases for many years to come.

First, what is causing the shortage? There are several different factors which are impacting this issue. In no particular order, the reasons for the herbicide shortage include a decline in number of laborers to unload tanker ships at gulf ports, lack of truck transportation from the ports to get the ingredients to U.S. formulation plants or formulated products to the retailers, reduced supplies of some of the inert ingredients of the formulation, shortages of materials to make containers and packaging, and Hurricane Ida that damaged a glyphosate production plant in Luling, LA.

Regardless of the cause, it is also important to consider herbicide costs. We are hearing that glyphosate prices will be in excess of $80/gallon. So, even if there is not a shortage, you should plan your weed control strategies for the next growing season to accommodate a limited availability because of supply or price of these two active ingredients.

It is important to point out that the demand for glyphosate will be considerably less in a conventional till system then in a no-till system. Glyphosate is arguably the most important

herbicide that facilitates no-till crop production. It's even more important in systems where cover crops are used and need to be terminated before corn or soybean planting. Therefore, one simple way to reduce reliance on glyphosate is to simply go back to using tillage for fall and early spring weed control. This practice will be very effective for controlling the weeds emerged at the time of tillage, but some farm operations may not be set up for the extra equipment, labor, and fuel needed to do this on a widespread basis. In addition, replacing burndown herbicides with tillage threatens soil conservation practices. Glufosinate demand, on the other hand, will not be impacted as much by choice of tillage system since we don't use glufosinate in our fall or spring burndown application, and not much is used in corn. There is some glufosinate used in delayed burndown situations. However, we mostly use glufosinate postemergence in soybeans after the crop and summer annual weeds have emerged.
If you're not interested in returning to widespread use of tillage, keep in mind that you are looking for ways to control winter annual weeds before planting and control grass weeds with other herbicides to decrease reliance on glyphosate for postemergence grass weed control. Secondly, regardless of tillage system, you want to build a solid residual program as the backbone of your weed control strategy to reduce reliance on using glyphosate postemergence in the crops. In the next section of this article, we will outline some weed control considerations based on the type of tillage system you are in and the weeds to be controlled at different times of the year.

Fall Applied Herbicides for Winter Annuals on No-Till Ground

If you are a cover crop user, plant high biomass producing covers that include cereal rye for horseweed suppression. *(EDITOR'S NOTE: Horseweed is commonly called mare's tail in much of the region).* Suppression of winter annuals other than horseweed can be somewhat variable, but we usually have better results if biomass production is high in the fall. If legumes are not planted with the cereal rye, we can also use 2,4-D or dicamba in the fall to control winter annual broadleaf weeds that emerge before winter freeze up. Weed control benefits from high biomass cover crops can also be realized for the 2022 growing season as well. We occasionally see some suppression of waterhemp and annual grasses as well with high biomass cover crops. *(EDITOR'S NOTE: Waterhemp has not been found in the ENY region yet)*.

If you are not a cover crop user and you use fall applied herbicides for winter annuals, consider taking out glyphosate and just using 2,4-D + dicamba mixtures this fall ***IF*** you only have broadleaf weeds [chickweed, henbit/deadnettle, shepherd's purse, field pennycress, mustard species, cressleaf groundsel, dandelion (which is a perennial), poison hemlock (a biennial), etc.] in your fields. If you have grass weeds (annual bluegrass, Carolina foxtail, false timothy, others), and they are small and actively growing, you can use reduced rates of glyphosate to control the grasses and rely on 2,4-D + dicamba mixtures to control the broadleaf weeds. Keep in mind that if you mix reduced rates of glyphosate with 2,4-D, dicamba or both, grass control can be compromised (herbicide antagonism). So, make those applications on a warm day and be sure to add AMS to the mix to minimize the risk of herbicide antagonism. In addition, we have observed that the addition of saflufenacil (Sharpen, others), can help speed the activity of glyphosate on some annual grass species. Again, if you are reducing the rate of glyphosate to conserve your supply, adding a saflufenacil product might improve the activity of

glyphosate. Remember to use MSO and a nitrogen source with saflufenacil for optimum foliar activity.

There are other active ingredients that provide some control or suppression of winter annual grass weeds and can be used in the fall, such as paraquat, clethodim (Select, others) and rimsulfuron (Resolve, Basis, Crusher, Matrix, others). These herbicides will be a bit more limited in the spectrum of weeds controlled compared to glyphosate. Therefore, make sure to properly identify the weeds present in the field and check if the weed species found are listed on labels of these products. Paraquat is commonly used with metribuzin (Sencor, TriCor, others) and 2,4-D or dicamba for fields going to soybean. For fields going to corn paraquat + simazine (Princep, others) + 2,4-D or dicamba would be an effective broadspectrum treatment. If you are using a clethodim or rimsulfuron product instead of paraquat, add 2,4-D or dicamba to help with broadleaf weeds.

Spring Applied Herbicides for Winter Annuals and Early Emerging Summer Annuals on No-Till Ground

For no-till corn acres, we have to design a program to 1) control the winter annual and early spring summer annual weeds that have emerged, 2) fit the crop being grown that summer, and 3) factor in the fairly long list of residual premixes that might have some combination of atrazine, isoxaflutole, mesotrione, rimsulfuron or thiencarbazone, metribuzin, or saflufenacil in them. All these herbicides have some foliar activity on early spring weeds and fit into a no-till burndown scenario. Isoxaflutole, rimsulfuron, and thiencarbazone have foliar and residual activity on grasses and will control a few selected broadleaf weeds. Metribuzin, saflufenacil, and mesotrione have foliar and residual activity on a key no-till weed, horseweed (aka mare's tail), and can also help with waterhemp and Palmer amaranth control. A group 15 herbicide (metolachlor, dimethenamid, pyroxasulfone, acetochlor) is also needed to form the backbone of the soil residual grass and small seeded broadleaf weed control program for the season.

As we get closer to the 2022 growing season and start planning for control of summer annual weeds it will be important to assess your supply of these active ingredients and build the backbone of your weed control program around full rates of residual herbicides so you can minimize reliance on postemergence herbicides. As mentioned in the introduction, there are many good references available to help you determine which residual herbicides best fit the weed species you are battling. Consult the weed response table such as these to choose the best product for each specific field. If you can build a weed control program that only requires one postemergence treatment of glyphosate or glufosinate, and possibly at a rate less than the maximum labeled rate, that will allow you to stretch glyphosate and glufosinate supplies over more acres. However, don't fall into the trap of thinking you only get one application of these herbicides so you should wait for the last weed flush before you spray. With limited supply and increased costs, the best route is to use a reasonable rate on small weeds with the best adjuvant system and application method possible. Use residual herbicides to manage other weed flushes.

Here are a few scenarios to consider based on the problematic weeds in a specific field. Keep in mind we do not endorse any specific product or company. We are simply pointing out which products, based on the active ingredients they contain, would be a good fit with the weed pressure we have mentioned. All the University Extension weed control guides and most of the guides written by the crop protection industry have weed efficacy tables in them to help the user determine which products provide acceptable control of the most common weeds in the specific geographical area covered by the guide. Of course, these guides assume all herbicide label recommendations are followed for the application and herbicide resistance in the weed population has been considered.

Example 1. A no-till corn field with lots of annual bluegrass or Carolina foxtail, and summer annual grass pressure. If the grasses are 3 inches or less in height, and you have a limited supply of glyphosate, consider using this combination for your burndown treatment – Corvus or Revulin Q at a full labeled rate. The thiencarbazone + isoxaflutole in Corvus or the rimsulfuron + mesotrione in Revulin Q will control small annual grasses. *(EDITOR'S NOTE: Corvus is not labeled for use in New York)*. Add atrazine (1 to 1.5 lb ai/A) and possibly a group 15 herbicide to boost residual broadleaf and grass weed control. If you have some emerged broadleaf weeds present when the burndown treatment is made, add saflufenacil, 2,4-D or dicamba to the mixture. For weeds that break through the residual treatment, use a postemergence treatment of glufosinate + dicamba or glyphosate + dicamba and add a 1/3 to ½ label rate of the atrazine premix products that contains a group 15 herbicide to lengthen the window of residual weed control in the crop. We know many growers won't use glufosinate in corn since it isn't always clear what hybrids are Liberty Link and they want to save the glufosinate for soybeans. You can also use Revulin Q, Realm Q, Armezon, Armezon PRO, Impact or Laudis for postemergence grass control if glyphosate or glufosinate is not available.

Example 2. What if the field in example 1 will be planted to soybean, rather than corn and is also infested with horseweed and waterhemp? The good news here is that there are several premixes available that have metribuzin in them. We have always observed better activity out of paraquat by adding a triazine herbicide to it and by simply adding paraquat and 2,4-D to a premix that has metribuzin in it, you have a ready-made, broadspectrum burndown and residual herbicide. The soybean premixed products that would fit this scenario include Authority MTZ, Canopy, Dimetric Charged, Intimidator, Matador, Boundary/Moccasin MTZ. *(EDITOR'S NOTE: Authority MTZ is not labeled for use in New York.)* The second choice would be to use clethodim for grasses + other herbicides to control broadleaf weeds. Clethodim can be used for emerged grasses, but activity will be slower in cool weather conditions and can also be antagonized by other components of the mixture (2,4-D, dicamba, acetochlor). Rimsulfuron can be used 30 days or more before planting soybean and may help with winter annual grasses, providing some residual control of summer annual grasses as well. Use of rimsulfuron would be best suited to STS or Bolt soybeans since they will be more tolerant to rimsulfuron. The postemergence weed control program will be based on the soybean trait planted and the weeds that break through the residual herbicide. Adding a group #15 residual herbicide (metolachlor, dimethenamid, pyroxasulfone, acetochlor) to the postemergence application will

be the backbone of your small seeded broadleaf and grass control program, and reduce the need for a second postemergence application later in the growing season.

Example 3. A no-till corn field with no winter annual grasses, but lots of horseweed (mare's tail), giant ragweed, and lambsquarters have started to emerge. The field has a history of having some foxtail, fall panicum and waterhemp, but the summer annual grasses and waterhemp don't emerge as early as the ragweed and lambsquarters. Use Acuron, Lumax/Lexar, Resicore, or Verdict. Add saflufenacil (not needed with Verdict since it contains saflufenacil), 2,4-D or dicamba to each of them for additional foliar activity on broadleaf weeds. Add atrazine to Resicore or Verdict for additional residual control of broadleaf weeds. If summer annual grass weeds have emerged, add paraquat or a pint/A of glyphosate to the mixture. If saflufenacil is added to one of the premixes that doesn't contain saflufenacil, add 20-30 gallons of UAN (if corn has not emerged) and MSO for burndown of small grasses and broadleaves. For weeds that break through the residual treatment, use glufosinate + dicamba or glyphosate + dicamba and add a 1/3 to ½ label rate of the atrazine premix product that contains a group 15 herbicide to lengthen the window of residual weed control in the crop. You can also use Revulin Q, Realm Q, Armezon, Armezon PRO, Impact or Laudis for postemergence grass control if glyphosate or glufosinate is not available.

Example 4. What if the field in Example 3 will be planted to soybean, rather than corn? In this field, broadleaf weeds (winter and summer annuals) and horseweed are the target with the burndown treatment. So, start of by determining which soybean trait will be planted. If it is non-GMO or straight Roundup Ready or Liberty Link, remember that there will be a preplant interval for 2,4-D or dicamba. The interval for 2,4-D will be shorter for these soybean traits. So, a mixture of 2,4-D + saflufenacil or metribuzin for broadleaf weeds will be the backbone of the burndown program and all that is likely needed for burndown if no grass weeds are present. As mentioned above, we will want to build the weed control program around a broadspectrum residual herbicide, so simply adding 2,4-D to premixes that contain saflufenacil (Verdict, Zidua Pro) or metribuzin (Authority MTZ, Canopy Blend, Intimidator, Kyber, Matador, Boundary/Moccasin MTZ, Trivence, or Panther Pro) makes the most sense and would require a 7 to 30 day preplant interval depending on the 2,4-D formulation and rate used. If you planted Enlist beans, you would use the same strategy, but no preplant interval is required if you use the 2,4-D choline (Enlist One) product from Corteva. If you plant Xtend soybeans, simply replace 2,4-D with an approved dicamba product (Engenia, Xtendimax, or Tavium) and no preplant interval is required for that trait. The postemergence weed control program will be based on the soybean trait planted and the weeds that break through the residual herbicide. Adding a group #15 residual herbicide to the postemergence application will be the backbone of your small seeded broadleaf and grass control program and reduce the need for a second postemergence application later in the growing season.

These are just a few examples of some different scenarios to consider when building a weed control program. Keep in mind that the concern isn't just the limited supply of glyphosate and glufosinate, but the increase in cost, especially glyphosate which may be 4X the cost just a few

years ago, which makes other herbicide options much more feasible that you didn't consider previously.

Other Tips:

- Target using "regular" rates of glyphosate to stretch supply. Instead of using 32 or 44 oz/acre of a Roundup brand product, consider using the standard rate on the label such as 22 oz/acre for Roundup PowerMax (Note – Roundup PowerMax3 will be launched in 2022 and the standard rate is 20 oz/acre; equivalent to 22 oz/acre of the old R. PowerMax formulation).
- Identify glyphosate or glufosinate premixes that may be in greater supply or at lower relative costs compared to solo glyphosate and glufosinate products.
- Failure is not an option for herbicide applications. Make sure you optimize your herbicide applications using the best methods (GPA, spray nozzles, etc.), adjuvants, and minimal weed size for foliar applications.
- Substitute alternative corn post herbicides that control grasses and broadleaves, if they don't include a residual group 15 herbicide, add one to the postemergence mixture.
- Cultivate if needed and/or possible.
- Hand weed escapes prior to the weeds setting seed.