Post-Harvest Weed Control in Wheat Stubble

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With wheat harvest a month behind and timely rains across much of eastern Colorado, it is time to consider post-harvest weed control in wheat stubble. Weeds present before harvest have recovered from cutting and are growing vigorously in the absence of crop competition. Any weeds that have germinated since harvest still have plenty of growing season left to cause problems. In either case, weeds should be controlled as soon as possible to prevent soil moisture use and seed production. Controlling seed production to reduce weed populations next season is particularly important when rotating to crops with limited options for in-crop weed control, like millet or sunflowers. From a disease standpoint, early control of volunteer wheat and grass weeds is important to break the green bridge and reduce spread of wheat streak mosaic and other viruses into next year's crop.

Kochia, Russian-thistle, and other warm season broadleaves tend to be the most problematic species at this time of year, but are by no means the only weeds present in many fields. Careful scouting and knowledge of each field's history is essential to choosing good control options. Consistent heat and moisture stress on the often large weeds found this time of year make challenging conditions for achieving good herbicide efficacy, particularly with glyphosate. The potential for glyphosate resistance in kochia and other weeds is another important consideration. At this point in the season, kochia, Russian-thistle, and the amaranths are flowering or close to it, and any resistant escapes have a high probability of successfully setting seed before they are detected. For these reasons, glyphosate should be avoided entirely for post-harvest use if possible. A notable exception to this guideline is when targeting grasses or volunteer wheat, where glyphosate is still a good choice when tank-mixed with other products.

If avoiding glyphosate entirely isn't feasible, tank mixing with additional mode(s) of action active on the target weeds is essential. Using high rates and adding ammonium sulfate (AMS) and other recommended surfactants are also key for good glyphosate activity under difficult conditions. AMS should be added to the tank after water and before any herbicides at rates determined by a recent water test, or at 17lb per 100 gallons if no water test is available. Another practice to improve herbicide efficacy is to spray only when temperatures are 80 to 85 F or less. When temperatures rise much above this, many plants start to shut their stomata and slow down metabolism, which can reduce the amount of herbicide taken into the plants. When weeds are under severe drought stress, it may be best to wait for a rain or a period of cooler temperatures to restore active growth before spraying.

Dicamba and 2,4-D (both synthetic auxin herbicides) are generally dependable options for broadleaf control alone, together, or tank-mixed with glyphosate or other chemistries. Occasional reports of poor kochia control with synthetic auxins indicate that at least some low-level resistance to these herbicides may be present in the region. Often, this sort of emerging resistance is only expressed in plants under stress – typical conditions for post-harvest applications. Again, tank mixing with multiple modes of action effective on the target weed(s) is the best response. Carfentrazone (Aim) is tank mix option for 2,4-D and glyphosate, adding broadleaf burndown activity. Saflufenacil (Sharpen) brings both burndown and short-term residual activity to tank mixes with glyphosate or dicamba. MSO plus a nitrogen source (AMS or UAN) are required for good contact activity of both products, and residual activity of Sharpen depends on adequate moisture after application. Aim and Sharpen are both PPO inhibitors.

For fields rotating to corn, topremazone (Impact) adds contact burndown activity from the HPPD inhibitor mode of action to glyphosate, 2,4-D, and many others, any time prior to planting corn. Atrazine, a photosystem II inhibitor, is an excellent base for a residual program for next year's corn, beginning post-harvest. While most residual herbicides don't have the durability to go out in mid-summer and last through the fall, atrazine does. For most other residual herbicides, split applications are probably a better approach. Split applications include a post-harvest burndown followed by a second application including a residual product later in the fall when conditions are more conducive to lasting pre-emergence activity. Products like Corvus, Spartan, and Authority MTZ are better used in this manner.

Paraquat (Gramoxone) is a very effective contact herbicide with a unique mode of action (electron transport diverter) and no rotational restrictions. Post-harvest applications are one of the best uses for paraquat, and a good opportunity to bring it into rotation for herbicide resistance management. Paraquat plus atrazine is an excellent option before corn. Another contact product effective on hard-to-control broadleaf weeds is Huskie, which combines a photosystem II inhibitor (bromoxynil) with an HPPD inhibitor (pyrasulfotole). For reliable performance on larger weeds, use a Huskie at a rate of at least 13.5 oz/ac, and include NIS and a nitrogen source according to label recommendations. The upfront cost for both products is relatively high for dryland acres, but this has to be weighed against the cost of allowing weeds to build up the seedbank. The cumulative cost of weed seedbank contributions can be quite high, particularly if any of the seeds are glyphosate resistant.

While large, stressed weeds are generally less susceptible to herbicides than small, actively growing ones, contact products like paraquat and Huskie are less affected by weed stress and size than most systemic products. If a period of dry, hot weather follows application, efficacy of contact herbicides is generally enhanced rather than diminished. Contact herbicides kill only plant tissues they cover though, so good coverage is absolutely critical for performance. To ensure this, use at least 15 gallons per acre carrier volume, and nozzles that deliver fine to medium sized spray droplets. Do not expect to achieve adequate coverage – or acceptable performance from contact herbicides – with coarse droplets and/or low carrier volumes. Surfactants are also particularly important for contact products. Check the labels for specific herbicides to see what surfactants are required, and make sure to include them. If allowable, methylated seed oil (MSO) and crop oil concentrate (COC) add more activity to herbicides than nonionic surfactant (NIS) and are preferred for post-harvest use.

For operations in which tillage is an option, it can be a good one after harvest. Sweep plows are very effective on large, tap rooted weeds like kochia and Russian-thistle, but still leave good amounts of standing stubble for erosion control and snow retention. For shallower-rooted or smaller weeds, more intensive tillage is usually necessary to get good control. Here, herbicides may be more economical by the time added moisture trapped by retaining standing stubble is accounted for.

However it is accomplished, control of weeds in winter wheat stubble within a few weeks of harvest is important. Moisture use and seed production by uncontrolled weeds can result in substantial yield losses in next year's crop and beyond. And as always, good scouting and field specific prescriptions are critical for optimum decisionmaking.