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AGRICULTURE AND NATURAL RESOURCES

Herbicide Programs for non-GMO Soybeans

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Essential Components of non-GMO Weed Management

- Plant non-GMO soybeans in fields with a history of several years of crop rotation and effective weed control that has prevented weed seed return to the soil and reduced weed populations.
- Maintain a rotation where non-GMO soybeans are planted every four years, with two years of corn and one year of traited soybeans in between, or other crops as appropriate for the farm operation.
- Start weed-free at planting by using tillage or a combination of fall and spring preplant burndown herbicides.
- Apply broad-spectrum residual (PRE) herbicides at full recommended rates in the spring before soybeans emerge, to reduce weed populations, slow weed growth, manage resistant weeds, and create flexibility in the postemergence application window.

- Apply the first postemergence (POST) treatment when weeds are less than 4 to 6 inches tall.
- Be aware that most populations of common and giant ragweed are resistant to ALS inhibitors (site 2 – FirstRate, Classic, Pursuit). Additionally, any waterhemp populations are resistant to both ALS inhibitors and PPO inhibitors (site 14 – fomesafen, Cobra), as well as glyphosate.

Fall Herbicide Treatments

Fall herbicide treatments should be used to manage marestail, winter annuals, dandelion, and other perennial weeds. Marestail can be especially difficult to control in no-till, non-GMO soybeans unless a fall herbicide treatment is used. We suggest applying a mixture of 2,4-D with one of the following: glyphosate, dicamba, a low rate of Canopy/Cloak EX/DF, or another ALS product (Basis, etc.). This should be followed by a spring preplant application of burndown, plus residual herbicides.



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Spring Preplant Burndown for No-till Soybeans

Where herbicide was applied the previous fall or marestail is not present:

- Glyphosate + one or more of following: 2,4-D, Elevore + 2,4-D, Sharpen, or Zidua PRO
- Gramoxone (2 to 3 pt) + 2,4-D (+ metribuzin, preferably)
- Glufosinate + 2,4-D
- Glufosinate + metribuzin

Where herbicide was not applied the previous fall and marestail is present:

- Glyphosate + 2,4-D plus either Sharpen or Zidua PRO (+ metribuzin, preferably)
- Gramoxone (3 to 4 pt) + 2,4-D + metribuzin
- Glufosinate + 2,4-D + metribuzin
- Glufosinate + Sharpen + metribuzin
- Glyphosate + glufosinate + 2,4-D

Use a Broad-Spectrum Residual (PRE) Herbicide

- Residual herbicides should:
 - control lambsquarters and marestail for the season (including ALS-resistant populations);
 - have activity on giant and common ragweed and on waterhemp (including ALS-resistant populations)
- Activity on annual grasses may also be desirable.
- Consult the *Weed Control Guide for Ohio, Indiana, and Illinois* for soybean herbicide effectiveness ratings (see Tables 13 to 16). Ratings of 8 or 9 indicate “control,” and ratings of 6 or 7 indicate “has activity on.”
- Some premix products with 2 or 3 herbicide components – that have activity on key weeds such as flumioxazin, sulfentrazone, metribuzin, and pyroxasulfone – may contain reduced rates of one or more of these components. Such mixtures can be supplemented with additional amounts of those individual components to reach the full recommended rate per soil type to improve control of waterhemp, marestail, etc.
- The most effective strategy for control of marestail:
 - Panther Pro, Trivence, or other premix of metribuzin plus flumioxazin (Valor, etc.) or sulfentrazone (Authority, etc.)
 - A mixture of metribuzin plus one of following: flumioxazin, sulfentrazone, Sharpen (1.5 to 2 oz)

Suggested Basic POST Program

- Apply first POST when most weeds are less than 4 to 6 inches tall. Use a spray volume of at least 15 gpa and

nozzles that maximize the activity of contact herbicides.

- Apply Fomesafen (1.3 to 1.5 pts/A) + grass herbicide (Select, Fusion, etc.) + COC or MSO.
 - Include AMS or 28% UAN. (Use of 28% can improve weed control but also increases crop injury.)
 - FirstRate, Classic, or Synchrony can be added to improve control of ALS-sensitive weeds.
 - Scout about ten days after first POST application. Apply Cobra or Phoenix (10 oz/A) as needed for weeds not completely controlled or late-emerging weeds.
- In fields without ALS-resistant weeds (be very sure about this before you go this route), it is possible to take the following approach in the first POST application: FirstRate (0.3 oz/A) or Classic (2/3 to 3/4 oz/A) + grass herbicide + COC or MSO + AMS. Fomesafen or Cobra can be added to improve control of ragweeds and waterhemp.
- Where soybeans are planted in wide rows (30 inches or greater apart), POST herbicides can be supplemented with between-row cultivation at appropriate timings.

Note on Giant Ragweed

Two POST applications are usually necessary to control giant ragweed unless the population is very low. Apply fomesafen when giant ragweed are 6 to 10 inches tall and follow-up with Cobra/Phoenix three weeks later. OSU research shows that this three-week interval works in all populations. Do not delay the first POST application and do not fail to make the second POST application because it appears that soybeans are close to canopy closure.

Note on Waterhemp

Planting non-GMO soybeans in fields with waterhemp is not recommended due to the high frequency of resistance to ALS and PPO inhibitors, which eliminates all POST options for control. In fields where waterhemp is absent or still sensitive to PPO inhibitors, follow the suggested basic POST program. One of the following herbicides can be included in the POST application to provide residual control of waterhemp for several more weeks – metolachlor, Zidua, Anthem, Outlook, Warrant.

Note on Marestail

There are no POST herbicides that control marestail in non-GMO soybeans. Effective control requires appropriate fall and spring burndown herbicides, and appropriate residual herbicides (see comments above).