



Managing Volunteer Corn in Soybeans

Introduction

Volunteer corn is one of the most competitive weeds in soybeans. Infestations can result from ear and kernel losses occurring in the previous season's corn crop. These losses occur from lodged or downed corn, dropped ears, or through the combine while harvesting. Wind storms can result in downed corn, and excessive precipitation can lead to diseases that can cause weakened stalks and lodging. Dropped ears can also occur from corn borers that feed on ear shanks. Lodged corn resulting in whole ears being lost is often the primary contributor to volunteer corn problems the next year.

Impact of Volunteer Corn in Soybeans

Research has demonstrated that low densities of volunteer corn can substantially reduce soybean yields.¹ University of Nebraska research showed a volunteer corn density of 3,500 plants/acre to result in a 10% yield reduction, and a 27% yield reduction by doubling the density to 7,000 plants/acre.² South Dakota State University research showed a 20% yield loss resulting from 5,000 volunteer corn plants/acre, which equates to just one volunteer corn plant every 3.5 feet. Clumps of volunteer corn associated with dropped ears were also found to be more competitive than individual plants scattered throughout a field. The University of Nebraska research that showed a 10% soybean yield reduction with 3,500 individual volunteer corn plants/acre also showed 3,500 clumps/acre to result in a 40% yield reduction. Researchers in Minnesota and Illinois showed that soybean yield was reduced 1% for every 75 to 115 clumps (7-10 plants/clump) of volunteer corn/acre.²

In addition, volunteer corn can attract and encourage corn rootworm beetles to lay eggs in soybean fields, increasing their threat to corn the following season and limiting the benefits of a corn-soybean rotation.³ If the previous year's corn crop was a *B.t.* rootworm product, it is likely that the volunteer corn will express a reduced level of *B.t.* toxin compared to its parent product, potentially selecting for resistance to that *B.t.* toxin. Therefore, it is important to control volunteer corn in soybeans.

Preventing Volunteer Corn in Soybeans

Management practices should be employed to help prevent infestations of volunteer corn in soybeans:

- Choose corn products with corn borer insect protection traits to manage ear drop problems caused by corn borers feeding on ear shanks.
- Harvest corn fields in a timely manner to minimize lodged or downed corn that can result in harvest losses.
- Make sure combines are properly adjusted to reduce harvest losses.

Preventing volunteer corn in soybean fields is the best way to avoid the need for control practices.



Preplant Control of Volunteer Corn

Volunteer corn can be controlled by cultivation or by the use of postemergence herbicides prior to planting soybeans. Strategies should be employed in the fall on corn fields where substantial lodging, ear drop, and harvest losses occurred. In areas where the soil is still warm enough after harvest for volunteer corn to germinate, a shallow tillage operation could be used to incorporate kernels and ears into the soil. This would be an attempt to encourage the corn to germinate in the fall and then die out over the winter or be controlled with an herbicide. However, allowing the seed to stay on the soil surface can also reduce populations the following season by allowing germination in the fall prior to freezing temperatures. Seed left on the surface is also much more susceptible to predation or decay. Using no-till practices

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can minimize seed-to-soil contact and the germination of volunteer corn seeds. Seed that is not incorporated into the soil and left on the surface may be much less likely to germinate and emerge the following spring.

Preplant tillage will control volunteer corn if the plants have emerged. Spring tillage can also help in the control of volunteer corn, but aggressive moldboard tillage is best to bury the seed. Shallow tillage (field cultivation) can kill emerged volunteer corn, but it can also plant other volunteer seeds which could lead to heavier populations of volunteer corn later in the season. Where volunteer corn pressure is expected to be high, consider planting those fields last to allow as much of the volunteer corn to germinate before the final control measure (tillage, herbicide, etc.) prior to planting.

Preplant burndown herbicide applications can be used in no-till fields for control of emerged volunteer corn. Knowing the herbicide traits in the prior year's corn is critical when selecting the burndown program. Roundup® brand agricultural herbicides, containing glyphosate as the active ingredient, will provide excellent control of volunteer corn that came from conventional or LibertyLink® (glufosinate-resistant) corn trait products. Liberty® herbicide, containing glufosinate as the active ingredient, can be used to help manage volunteer corn that came from conventional or glyphosate-resistant corn products. However, Liberty herbicide may not be effective on volunteer corn that contains the LibertyLink trait. Resistance of the volunteer corn to herbicides is an important factor when considering control options.

Gramoxone® herbicide, containing paraquat as the active ingredient, can also be used for preplant control of emerged volunteer corn. However, much like glufosinate, paraquat is a contact herbicide and may not provide complete control of volunteer corn. The addition of a photosynthesis-inhibiting herbicide (metribuzin, linuron) in a tank mixture with Gramoxone is recommended to improve the control of volunteer corn and provide residual weed control. Refer to herbicide product labels for use restrictions when applying prior to soybean planting.

Postemergence grass herbicides (ACCCase inhibitors), such as Select Max® and Fusilade® DX herbicides, will control emerged volunteer corn in soybeans, either before planting or after the crop has emerged. These products can be tank mixed with Roundup® brand agricultural herbicides to broaden the spectrum of weeds controlled. However, consult product labels for recommended additives to use.

It is important to be timely with herbicide applications to limit volunteer corn competition to soybeans. Delaying applications may lead to yield loss and take longer to control plants. Always refer to herbicide product labels for recommended application rates and additives, approved tank mixtures, use instructions, precautions, and restrictions.

Sources

- ¹ Alms, J., Moechnig, M., Vos, D., and Clay, S. 2016. Yield loss and management of volunteer corn in soybean. *Weed Technology* 30:254-262.
- ² Jhala, A. and Rees, J. 2018. Got volunteer corn? *Nebraska Farmer*. <https://www.farmprogress.com>.
- ³ Nicolai, D., Stahl, L., and Gunsolus, J. 2018. Managing the potential for volunteer corn in 2019. University of Minnesota Cooperative Extension. <https://blog-crop-news.extension.umn.edu>.

Legal Statements

Performance may vary, from location to location and from year to year, as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible and should consider the impacts of these conditions on the grower's fields.

ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS. Tank mixtures: The applicable labeling for each product must be in the possession of the user at the time of application. Follow applicable use instructions, including application rates, precautions and restrictions of each product used in the tank mixture. Not all tank mix product formulations have been tested for compatibility or performance other than specifically listed by brand name. Always predetermine the compatibility of tank mixtures by mixing small proportional quantities in advance. Roundup® is a registered trademark of Bayer Group. Gramoxone® is a registered trademark of a Syngenta group company. Liberty® and LibertyLink® are trademarks of BASF Corporation. Select Max® is a registered trademark of Valent U.S.A. Corporation. Some of the product(s) discussed herein are restricted use pesticide(s) and may not be registered in all states. The distribution, sale, or use of an unregistered pesticide is a violation of federal and/or state law and is strictly prohibited. Check with your local dealer or product representative for the product registration status in your state. All other trademarks are the property of their respective owners. ©2019 Bayer Group. All rights reserved. 2004_S1

