Considerations for Managing Ear Drop in Corn

CROP BULLETIN

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Conditions that can Cause Ear Drop

- **Moisture stress at silking:** The shank develops quickly during a two-week period surrounding pollination. Severe drought and heat stress at that time can hinder shank development.
- **Favorable weather after drought stress:** Ear drop is most common when drought/heat stress during ear and shank development is followed by favorable weather during grain fill. Weak shanks formed during pollination are unable to hold on to heavier ears.
- **Rapid dry down:** Cells at the point of ear attachment become more brittle during rapid dry down making them vulnerable to ear drop.
- **Disease:** Stalk rot pathogens can weaken ear shanks.

Fungal disease in the shank was a contributing factor that caused this ear to drop.

Why does ear drop differ among hybrids?

- Certain hybrids are able to set more kernels during drought stress. In some cases, hybrids with excellent drought tolerance can set large ears but have relatively weak shanks.
- Timing of drought/heat stress can affect certain relative maturities differently during the shank development stage.
- Plant breeders and agronomists actively select against hybrids vulnerable to ear drop.

Tips for harvesting vulnerable fields

- In standing corn, adjust header height as close to the ear as possible. This reduces stress on the ear shank.
- Keep ground speed around 3.0 miles per hour.
- Slow down the speed of the corn head to minimize shaking of the plant as it enters the head.
- Measure losses and make corrective machine adjustments whenever crop conditions change.

What is the yield impact of dropped ears?

- Yield loss can be estimated by counting the number of dropped ears in 1/100th acre.
- Harvest swath length equal to 1/100th of an acre is shown below for various header widths and row spacings.

Table 1. Swath width equal to 1/100th acre (ft, in)

Rows	Row Spacing (inches)				
	20	22	30	36	38
6	43’ 7”	39’ 7”	29’ 0”	24’ 2”	22’ 11”
8	32’ 8”	29’ 8”	21’ 9”	18’ 2”	17’ 2”
12	21’ 9”	19’ 10”	14’ 6”	12’ 1”	11’ 6”
16	16’ 4”	14’ 10”	10’ 11”		
18	14’ 6”	13’ 2”			

Table 2. Estimated yield loss resulting from dropped ears*

Yield Level	Dropped ears per 1/100 acre				
	2	4	6	8	10
	bu/acre				
250	1.5	2.9	4.4	5.9	7.4
225	1.3	2.6	4.0	5.3	6.6
200	1.2	2.4	3.5	4.7	5.9
175	1.0	2.1	3.1	4.1	5.1
150	0.9	1.8	2.6	3.5	4.4
125	0.7	1.5	2.2	2.9	3.7

*based on population of 34,000 plants/acre

Yield Impact of Volunteer Corn

- Volunteer corn can reduce yield, like any other weed species, by competing with the crop for available resources such as light, nutrients, and water.
- Volunteer corn plants from dropped ears are more likely to emerge in clumps than as randomly dispersed plants.
- Plants in a clump must compete with each other in a limited space for the same light, water, and nutrients, making them less competitive with the crop than randomly dispersed plants.

Table 3. Predictions of corn yield loss due to volunteer corn ear clumps based on University of Minnesota research data.

Volunteer corn density (ear clumps/acre)	Yield Loss (%)
100	0.2
500	1.2
1000	2.4

Stahl, L.A.B., M.J. Haar, J.K. Getting, R.P. Miller, and T.R. Hoverstad. 2007. Effect of glyphosate-resistant volunteer corn on glyphosate-resistant corn. Proc. North Central Weed Sci. Soc. 62:48.

Volunteer Corn Management Options

Selective Use of Fall Tillage

- In southern corn producing areas where the growing season is longer, early fall tillage can stimulate germination and emergence of volunteer corn prior to the winter freeze, thus reducing the amount of potential emergence the following spring.
- If early fall tillage is not feasible or soil conditions are not conductive for seed germination, another strategy is to avoid fall tillage altogether. Incorporation of seeds into the soil provides a favorable protective environment for winter survival; whereas, seed left exposed on the surface are more susceptible to decay or predation.
- Fall tillage will likely be counterproductive if the soil is too dry for corn seeds to germinate and emerge before the winter freeze.

Image courtesy of CaseIH

Spring Tillage

- Spring tillage can effectively manage germinated and emerged seedlings.
- However, if conditions prior to spring tillage are not conducive to germination and a large quantity of viable seed remains on the surface, tillage may effectively "plant" more volunteers than it controls.
- Vertical tillage implements intended primarily to manage residue with minimal soil disturbance are less effective at removing emerged volunteer plants and may make things worse by shattering ears and spreading seed.

Crop Rotation

- Rotating to a different crop expands herbicide options for controlling volunteer plants. Selective grass herbicides, such as Assure® II, effectively control volunteer corn in soybean.

Herbicides

- The ACCase herbicides, such as Assure II, Fusilade®, Fusion®, Poast®, and Poast Plus®, can be used to control volunteer corn in soybean but have intervals ranging from 30 to 120 days after herbicide application before corn can be planted.
- Select Max® has a plant/replant interval of only 6 days for corn and thus is the only ACCase herbicide that can be used for control of volunteer corn before planting.

Table 4. Herbicide options for controlling volunteer corn ahead of corn planting.

Herbicide	Notes
SelectMax	• Labeled rate: 6 fl oz/acre • Do not plant earlier than 6 days after application • Applications should include NIS and AMS
Gramoxone Inteon® + metribuzin	• Labeled rate: 24-48 fl oz/acre (Gramoxone Inteon) + 2-5⅓ oz/acre (metribuzin 75) • No restriction on planting timing following application

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The foregoing is provided for informational use only. Please contact your sales professional for information and suggestions specific to your operation. Product performance is variable and depends on many factors such as moisture and heat stress, soil type, management practices and environmental stress as well as disease and pest pressures. Individual results may vary. FF150624 (200727) 15:03 06/15