

## Corn Replanting Decisions

- Various conditions can cause reduced corn stands; it is important to identify the cause before deciding whether to replant.
- Evaluate the existing stand for survival potential and uniformity before deciding to replant.
- Compare the yield potential of the existing stand with the yield potential of a replanted stand.

### Evaluating the Existing Stand

When evaluating corn stands, only count plants that have a good chance of survival. Observe the uniformity of the stand across the field to decide whether replanting the entire field or portions of the field is justified. Spot-planting without destroying the existing stand is not recommended.<sup>3</sup> There may be low areas in fields that will not survive, while the rest of the field will have a good stand. Replanting only the drowned out areas may be a viable option. Carefully evaluate the field for replant options.

One way to evaluate corn stands is to count the number of plants in a length of row equal to 1/1,000<sup>th</sup> of an acre based on row width (Table 1). Multiply the number of plants by 1,000 to get the plants per acre (ppa). Repeat the process in several locations in the field.

A more accurate method is to count 150 plants and measure the distance from start to finish with a measuring wheel. Divide the number of feet traveled into the appropriate factor in Table 2 to determine plant population. For example, if you walked 94 feet while counting 150 plants in 30-inch rows, the population is  $2,613,600 \div 94 = 27,804$ . Because a longer row length is counted, the samples are more representative and fewer locations are required. Use the same factors for both 30-inch twin- and single-row stand counts; however, the plants in both the twin rows should be counted.

**Table 1. Stand count evaluation for 1/1,000<sup>th</sup> acre based on row width and number of plants in a given row length.<sup>1</sup>**

Row Width (inches)	Row Length 1/1,000 <sup>th</sup> acre (feet, inches)
20	26' 2"
22	23' 9"
30	17' 5"
36	14' 6"
38	13' 9"

**Table 2. Stand count evaluation factors, by row width, for measuring the distance when counting 150 plants.<sup>1</sup>**

Row Width (inches)	Factor
20	3,920,400
22	3,564,000
30	2,613,600
36	2,178,000
38	2,063,350

### Deciding Whether to Replant

After taking stand counts, consider the yield potential of the current stand compared to the yield potential of the targeted replanting date and population, and the costs associated with replanting. Table 3 illustrates percent of maximum grain yield expected from various planting dates and final plant populations, based on uniform stands.

### When the Decision is Made to Replant

First, the existing stand should be removed. Tillage is an option in many cases, and should be done at an adequate depth to properly control the original stand. Depending on the growth stage of the original stand, two tillage passes may be necessary. If a pre-emergence herbicide has been applied, tillage may decrease the efficacy of the herbicide by placing it deeper than ideal for satisfactory weed control. Additionally, tillage prior to replanting may result in loss of soil moisture. In drier areas, and where soil conditions allow, a more favorable option might be applying a herbicide to remove the original stand and then replanting without tillage. Roundup<sup>®</sup> brand agricultural herbicides are also an option when the original stand does not contain the Roundup Ready<sup>®</sup> Corn 2 trait or Roundup Ready<sup>®</sup> 2 Technology. If the original stand does contain the Roundup Ready<sup>®</sup> Corn 2 trait or Roundup Ready<sup>®</sup> 2 Technology, the tank mix options in Figure 1 can provide

**Table 3. Relative yield potential for corn with different planting dates and populations.<sup>2</sup>**

Population (ppa)	Planting Date				
	4/20 - 5/2	5/2 - 5/15	5/15 - 5/25	5/25 - 6/5	6/5 - 6/15
	--- % of Maximum Yield ---				
45,000	97	93	85	68	52
40,000	99	95	86	69	53
35,000	100	96	87	70	54
30,000	99	95	86	69	53
25,000	95	91	83	67	51
20,000	89	85	77	63	48
15,000	81	78	71	57	44
10,000	71	68	62	50	38

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control of the original stand. The original plants must exhibit growing green tissue and two to four leaves for the herbicides to be effective. Complete kill may take up to 21 days after application. Liberty® herbicide can be used to remove corn that does not contain the LibertyLink® trait; however, control may be inconsistent.<sup>6</sup> It is important to note that Genuity® SmartStax® RIB Complete® corn blends have tolerance to Liberty® herbicide in addition to Roundup® brand agricultural herbicides. For these reasons, the options shown in Figure 1 are recommended for more consistent control.

Second, determine which relative maturity (RM) to use when replanting. As planting occurs after May 1, corn requires approximately 1.6 fewer growing degree days (GDDs) per day of delayed planting to reach flowering.<sup>4</sup> GDDs required to reach physiological maturity, or black layer, decreases approximately 6.8 GDDs per day of delayed planting after May 1.<sup>4</sup>

Third, decide on a management practice to protect against corn rootworm and other soil insects, as well as European Corn Borer (ECB). Most soil insecticides cannot legally be applied twice in the same growing season in the same location in a field. Growers can replant over the old row and expect some control from the first application of soil insecticide. Another option is to use a different soil insecticide when replanting. A third option is to replant with a corn trait for the Genuity® brand. Genuity® SmartStax® RIB Complete®, Genuity® VT Double PRO® RIB Complete®, and Genuity® VT Triple PRO® RIB Complete® corn blends offer multiple modes of action for protection against a broad spectrum of insects. Later planted corn is more susceptible to second generation ECB. Research from The Ohio State University suggested significant advantages in overall yield and consistency of yield for corn with the corn borer-protection trait compared to their conventional counterparts, when planted in late May and early June.<sup>3</sup>

Finally, later planted corn has a greater chance of being exposed to heat and drought stress during pollination. This risk can be managed by selecting corn with heat and drought tolerance and early flowering.

Figure 1. Tank mix options for removing corn for replant.

## Option 1:

Select Max®	6 oz/acre
Non-ionic Surfactant	0.25% v/v
Ammonium Sulfate	1 to 2% by dry weight or 8.5 to 17 lbs per 100 gallons of water

- Apply in a minimum of 10 gallons of water per acre.
- Treat prior to volunteer corn reaching 12 inches in height.
- Replant corn no sooner than 6 days after application.
- May be applied as a tank mixture with Roundup® brand agricultural herbicides.
- Care must be taken to avoid in-field boom (spray) overlaps or excessive crop injury may occur.

## Option 2:

Gramoxone Inteon®	2.5 pt/acre (for corn 1 to 3" tall) <b>OR</b> 3 pt/acre (for corn 3 to 6" tall)
Metribuzin DF®	3 oz/acre
COC	1% v/v

- Apply in a minimum of 10-15 gallons of water per acre.
- There are no plant back restrictions.
- Clarity® herbicide may be added at 8 oz/acre for enhanced control of marestalk and other tough-to-control broadleaves.
- 2,4-D at 1 pt/acre may be added, but typically requires a 7 day plant back interval depending on the product and rate applied. Check the Clarity and 2,4-D labels for specific instructions.

Sources: <sup>1</sup> Nafziger, E.D. et al. 2002. Illinois agronomy handbook, 23rd edition. University of Illinois Printing Services. Urbana, IL. 27-33;

<sup>2</sup> Elmore, R. and L. Abendroth. 2009. Assessing corn stands for replanting. Iowa State University. Integrated Crop Management News. <http://www.extension.iastate.edu> (verified 5/18/2014);

<sup>3</sup> Thomison, P. 2005. Replant considerations: hybrid selection issues. The Ohio State University. C.O.R.N. Newsletter 2005-13. <http://corn.osu.edu> (verified 5/18/2014)

<sup>4</sup> S. Brouder et al. 2007. Corn & soybean field guide. Purdue University;

<sup>6</sup> Hager, A. 2012. Options to control corn plants from the initial planting. University of Illinois. The Bulletin. Issue 3. Article 4. <http://bulletin.ipm.illinois.edu> (verified 5/18/2014).

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