# AGRONOMIC ALERT

Technology Development & Agronomy by MONSANTO

## Corn Replanting Decisions

Cool temperatures and wet conditions can put stress on corn germination and emerging seedlings. This may cause some concern about reduced corn stands. Before deciding to replant, evaluate the stand for population and uniformity. Next, compare yield potential of the existing stand with yield potential of the replant, as well as insurance or government program restrictions. Finally, if the decision is made to replant, consider various management practices discussed in this ALERT to help optimize yield potential.

### 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. Spotting in without destroying the existing stand is not recommended[3]. 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 1/1,000th of an acre based on row width (Table 1). Multiply the number of plants by 1,000 to get the plants per acre. 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 ÷ 94 = 27,804. Because a longer row length is counted, the samples are more representative and fewer locations are required.

Utilize 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. Row length for 1/1,000th acre based on row width[1].

| Row Width (inches) | Row Length 1/1,000th acre (feet, inches) |
|---|---|
| 20 | 26’ 2” |
| 30 | 17’ 5” |

Table 2. Stand count evaluation factors, by row width, for measuring the distance when counting 150 plants[1].

| Row Width (inches) | Factor |
|---|---|
| 20 | 3,920,400 |
| 30 | 2,613,600 |

### Deciding Whether to Replant

After taking stand counts, consider the yield potential of the current stand, compared to the yield potential of the target replanting date and population, and the costs associated with replanting. Tables 3 and 4 provide the percent of maximum yield expected based on final, uniform plant stands and planting dates. Table 3 pertains to fields that have consistently yielded at least 175 bu/acre. Table 4 pertains to fields that have consistently yielded 125 to 175 bu/acre.

Table 3. Percent of Maximum Yield Expected Based on Final Plant Stands and Planting Dates in Fields that Have Consistently Yielded at Least 175 bu/acre[2].

| | Final Plant Population (x1000) Per Acre | | | | | | |
|---|---|---|---|---|---|---|---|
| | 10 | 15 | 20 | 25 | 30 | 35 | 40 |
| Planting Date | ———% of Maximum Yield——— | | | | | | |
| April 1 | 54 | 68 | 78 | 88 | 95 | 99 | 99 |
| April 10 | 57 | 70 | 81 | 91 | 97 | 100 | 100 |
| April 20 | 58 | 71 | 81 | 91 | 97 | 100 | 99 |
| April 30 | 58 | 70 | 80 | 89 | 95 | 97 | 96 |
| May 9 | 55 | 68 | 77 | 86 | 91 | 93 | 91 |
| May 19 | 50 | 63 | 72 | 80 | 85 | 86 | 84 |
| May 29 | 44 | 56 | 65 | 73 | 77 | 78 | 75 |
| June 8 | 35 | 47 | 56 | 63 | 67 | 67 | 64 |

Table 4. Percent of Maximum Yield Expected Based on Final Plant Stands and Planting Dates in Fields that Have Consistently Yielded 125 to 175 bu/acre[4].

| | Plant Population (x1000) Per Acre | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 | 34 | 36 |
| Planting Date | ———% of Maximum Yield——— | | | | | | | | | | | | |
| April 10 | 68 | 73 | 78 | 82 | 85 | 88 | 91 | 92 | 93 | 94 | 94 | 93 | 91 |
| April 15 | 71 | 76 | 81 | 85 | 88 | 91 | 94 | 95 | 96 | 97 | 96 | 96 | 94 |
| April 20 | 73 | 78 | 83 | 87 | 90 | 93 | 96 | 97 | 98 | 99 | 98 | 98 | 96 |
| April 25 | 74 | 79 | 84 | 88 | 92 | 94 | 97 | 98 | 99 | 100 | 100 | 99 | 97 |
| April 30 | 74 | 79 | 84 | 88 | 92 | 95 | 97 | 99 | 100 | 100 | 100 | 99 | 97 |
| May 5 | 73 | 79 | 83 | 87 | 91 | 94 | 96 | 98 | 99 | 99 | 99 | 98 | 97 |
| May 10 | 71 | 77 | 82 | 86 | 89 | 92 | 94 | 96 | 97 | 97 | 97 | 96 | 95 |
| May 15 | 69 | 74 | 79 | 83 | 87 | 89 | 92 | 93 | 94 | 95 | 95 | 94 | 92 |
| May 20 | 65 | 71 | 75 | 80 | 83 | 86 | 88 | 90 | 91 | 91 | 91 | 90 | 89 |
| May 25 | 61 | 66 | 71 | 75 | 79 | 81 | 84 | 85 | 86 | 87 | 87 | 86 | 84 |
| May 30 | 55 | 61 | 65 | 70 | 73 | 76 | 78 | 80 | 81 | 81 | 81 | 80 | 79 |
| June 4 | 49 | 54 | 59 | 63 | 67 | 70 | 72 | 74 | 75 | 75 | 75 | 74 | 73 |
| June 9 | 42 | 47 | 52 | 56 | 60 | 62 | 65 | 66 | 67 | 68 | 68 | 67 | 65 |

*Continued on next page*

# Corn Replanting Decisions

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## 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® brand agricultural herbicides are also an option when the original stand does not contain the Roundup Ready® Corn 2 trait or Roundup Ready® 2 Technology. If the original stand does contain the Roundup Ready® Corn 2 trait or Roundup Ready® 2 Technology, the tank mix options in Figure 1 can provide 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.

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

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 can not 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 corn containing the Genuity® family of traits. Depending on region and insect pests present, Genuity® SmartStax® RIB Complete™ and Genuity® VT Double PRO® RIB Complete™ corn blends, and Genuity® VT Triple PRO® Corn 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[3].

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 | 2.5 to 4 lbs./acre |

- 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 by 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) OR 3 pt/acre (for corn 3 to 6" tall) |
| plus | |
| Metribuzin DF® | 3 oz/acre |
| plus | |
| COC | 1% v/v |

- Apply in a minimum of 20 gallons of water per acre.
- There are no plant back restrictions.
- Clarity® herbicide may be added at 8 oz/acre for enhanced control of marestail 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.
- Check the Clarity and 2,4-D labels for specific instructions.

*Sources:* [1] *Nafziger, E.D. et. al. 2002. Illinois agronomy handbook, 23rd edition. University of Illinois Printing Services. Urbana, IL. 27-33.*

[2] *Nafziger, E.D. et. al. 2009. Illinois agronomy handbook, 24th edition. University of Illinois Board of Trustees. Urbana, IL. 24.*

[3] *Thomison, P. 2005. Replant considerations: hybrid selection issues. The Ohio State University. C.O.R.N. Newsletter 2005-13.* http://corn.osu.edu (verified 4/11/2012)

[4] *S. Brouder et al. 2012. Corn & soybean field guide. Purdue University.*