Removing a Poor Stand of Corn Before Replanting

- Wet conditions and below average temperatures can put stress on corn germination and emerging seedlings causing concern about reduced corn stands.
- Before deciding to replant, evaluate the stand for population and uniformity and then 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 to help optimize yield potential.

Deciding Whether to Replant

After taking stand counts, consider yield potential of the current stand, compared to yield potential of the target replanting date and population, and the costs associated with replanting. According to Mississippi State University research, a yield reduction of 6 to 9% can be expected when irrigated corn populations are reduced to 24,000 plants/acre.[1] A similar yield reduction can be expected for dryland corn when populations are reduced to 18,000-20,000 plants/acre. When plant populations are reduced lower than 24,000 plants/acre for irrigated corn and 18,000 to 20,000 plants/acre for dryland corn, the potential for yield loss increases. Also be sure to take into consideration the uniformity of the stand. Corn plants are intolerant to emergence variability and plants that are late to emerge may not catch up in size to other plants.

Removing an Existing Stand

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.

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 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. Liberty® herbicide can be used to remove corn that does not contain the LibertyLink® trait; however, control may be inconsistent[2,3]. It is important to note that Genuity® SmartStax® RIB Complete® corn blend has 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.

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 be applied as a tank mixture with Roundup® brand agricultural herbicides.
- Care must be taken to avoid in-field boom (spray) overlaps or 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)
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 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 depending on the rate applied.
- Check the Clarity and 2,4-D labels for specific instructions.

Replant Decisions

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[2]. The number of GDDs required to reach physiological maturity, or black layer, decreases approximately 6.8 GDDs per day of delayed planting after May1st[6]. Thus, the best RM for replanting may not be as early as you might think.

Decide on a management practice to protect against corn rootworm and other soil insects, as well as European corn borer. 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®, Genuity® VT Triple PRO® RIB Complete®, and Genuity® VT Double PRO® RIB Complete® corn blends offer multiple modes of action for protection against a broad

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spectrum of insects. Later planted corn is more susceptible to second generation European corn borer. Research conducted at the Monsanto Learning Center in Scott, MS suggested advantages in overall yield and consistency of yield for corn with the corn borer protection trait compared to conventional counterparts, when planted in late May.[4]

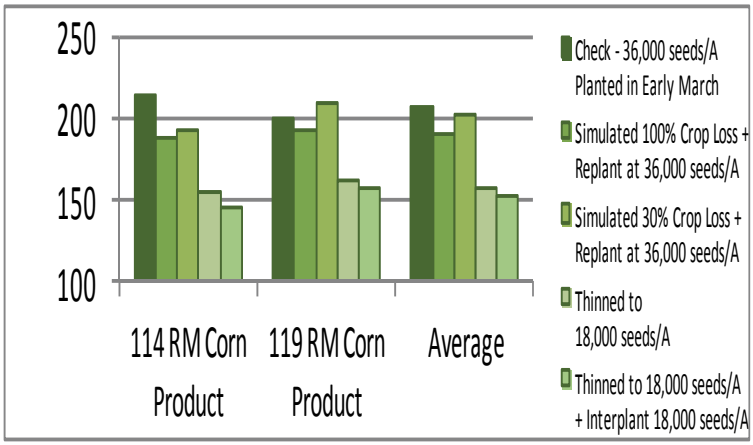
Later planted corn has a greater chance of being exposed to heat and drought stress during pollination. This risk can be managed by selecting corn products with heat and drought tolerance and early flowering characteristics.

Replant Research

In 2009 and 2010, a study on corn replant strategies was conducted at the Monsanto Learning Center at Scott, MS to better assess how replant decisions can affect final harvest yield. Two corn products were selected: a 114 RM and a 119 RM. Large blocks of both corn products were planted in March at 36,000 seeds/acre. The trial was comprised of four simulated replant scenarios and a check consisting of the original stand. Excluding the check, all other plots were treated about 25 days after planting. The treatments were as follows:

- Check plot: left as planted.
- Simulated 100% crop loss: SelectMAX® herbicide applied across the entire plot and replanted on 4/20/09 and 4/22/10 at 36,000 seeds/acre.
- Simulated 30% crop loss: SelectMAX herbicide applied across a block of 30% of the plot and the block replanted on 4/20/09 and 4/22/10 at 36,000 seed/acre.
- Simulated poor stand with no replant: Stand thinned to 18,000 seeds/acre and not replanted.
- Simulated poor stand with interplant: Stand thinned to18,000 seeds/acre and the entire plot interplanted on04/20/09 and 4/22/10 at 18,000 seeds/acre.

Figure 2. Average yield from 2009 and 2010 corn replant study, at Monsanto Learning Center at Scott, Mississippi.



Corn yields were reduced in both scenarios where corn stands were thinned to 18,000 seeds/acre and either left at 18,000 seeds/acre or interplanted with an additional 18,000 seeds/acre (Figure 2). In the thinned and interplanted scenario, the poor plant spacing resulted in yield reductions caused by poor interception of light, nutrients, and water. In the 18,000 seeds/acre plant population, less competition within the row still did not make up for the fewer number of plants for grain production. When averaged across both years and corn products, the simulated 100% crop loss scenario yielded 16.25 bu/acre less than the check plot. For the simulated 30% crop loss scenario, Select Max® was applied to kill all corn seedlings in a section equaling 30% of the total plot. This section was then replanted. The simulated 30% crop loss scenario yielded 6 bu/acre less than the check plot when averaged across corn products and years.

Evaluation of average yield results from 2009 and 2010 data suggest highest yields are obtained when an ideal planting population is maintained throughout the growing season. The data also suggests that in situations where early-season crop loss occurs to an entire field or portion of a field, some yield may be recovered. This points out the potential for successful spot planting, which could also be applied to larger field areas such as corners, ends, and washes. While these areas may be successfully replanted, special consideration should be given to area-specific agronomic management, inputs needed, and weather influences on the ultimate outcome. The same corn products should be used when replanting a portion of a field.

Replanting is time consuming and costly to producers, but it can be a viable agronomic practice given the right conditions. Careful consideration of the stand should always be taken before making the decision to replant.

Sources:

[1]Larson, E. and J. Bond. Corn replanting guidelines and management issues with wet weather. 26 April 2013. Mississippi State University Extension Service. (verified 54/10/2014); [2]Monsanto data. 2006-01-46-04; [3]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 4/10/2014); [4]Evaluation of Genuity® VT Triple Pro® Corn at different planting dates. 2010. Monsanto Learning Center Summary. Scott, MS. (verified 4/10/2014).