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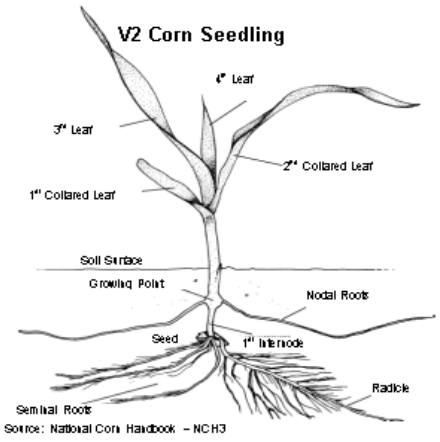
Replanting Guidelines for Corn

Our 2017 planting season has certainly gotten off to a slow start. For those who do have some corn planted and with the recent cold, wet weather it'll be critical to properly assess your fields to determine if replanting may be justified. Many factors can cause unexpected stand loss and unevenness. Deciding to replant to achieve a desired plant population is often a difficult decision. Before making a replant decision that incurs additional costs, it's important to evaluate the existing stand, its health, population and distribution and yield potential versus replant.

Evaluating Seed and Seedling Health

When corn is not germinating or emerging, as it should, it is time to dig. If the seed is firm and looks healthy, it still has a good chance for germination and emergence. A water-soaked, mushy appearance indicates seed rot or decay. The same is true for the seedling. If the coleoptile (shoot), radicle (root) and seed tissue appear healthy, the seedling is in good condition. A water-soaked, mushy appearance indicates poor health and seedling decay. It is important to check the condition of the stand every few days to evaluate growth.



If an emerged stand is uneven or damaged, the potential for recovery and growth should be evaluated. It will be necessary to locate the growing point to evaluate it. Dig up a few plants, split them down the center and look for a triangular shaped structure at the point of nodal root growth, about ¾ to 1 inch below the soil surface. The growing point will remain below the soil surface until five to six collared leaves (V5 to V6) have fully unfurled. A healthy growing point will have a light colored appearance with a firm texture. New leaves emerging every three to five days indicate normal growth. A damaged growing point will have a distinct yellow to brown, water-soaked appearance with a mushy texture.

Evaluating Stands: Plant Population and Distribution

It's important to determine the plant population and distribution (uniformity) of the existing stands. Count the number of viable plants in 1/1000th of an acre and multiply by 1000 to obtain the plant population per acre. Take enough counts in the field to represent the existing stand. Sometimes, plants that are weak or questionable in growth should not be counted. While taking stand counts, observe plant distribution. Are plants evenly spaced in the row(s) or are there skips or gaps? Observe the general plant population pattern over the field. Is it low overall or just in spots?

Row Width (in)	Row Length
15	34' 10"
20	26' 2"
22	23' 9"
30	17' 5"
36	14' 6"

Existing Stand Potential versus Replanting

After plant population and health have been evaluated, yield potential of the current stand versus replanting can be determined. The following table can be used to estimate yield potential. The yield values (expressed as a percent of maximum) are based on uniform distribution of plants within the row(s), which is not usually the case. University of Illinois studies indicate that yields could be reduced about 2 percent with several 1½' to 3' gaps and about 5 percent with numerous 4' to 6' gaps.

Relative Yield Potential of Corn by Planting Date and Population

Established Stand*	Planting Date				
	4/20 – 5/5	5/5 – 5/15	5/15 – 5/25	5/25 – 6/5	6/5 – 6/15
	Percent 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

Note: Values based on preliminary Iowa research and modeling; 100% yield potential is estimated to occur with 35,000 plant population and early planting. From Iowa State University Extension, Corn Field Guide, CSI 001. 2009 In Press

Compare the yield percent of the existing stand with a full stand at the expected replant date. Here's an example for reference. Corn is planted on April 28th for a desired stand of 35,000 plants per acre (ppa). A hailstorm on May 16th reduced the emerged stand to 20,000 ppa. If replanting can take place on May 20th, should the field be replanted? Based on the values in the table, a reduced stand of 20,000 viable or healthy plants per acre (ppa) would yield 89% of maximum. Replanting on May 20th to achieve the desired stand would yield 87% of maximum. In this case yields of the original planting would be higher and replanting isn't justified. However, uniformity of the existing stand could further lower yield potential and make replanting justifiable. In addition if stand health is very questionable or regrowth can delay maturity, replanting may be the best option.

Due to unique characteristics and adaptability, some hybrids can tolerate and compensate for lower stands better than others. For example a flex eared hybrid is better able to compensate for lower stands than a determinate eared hybrid. However, if the existing stand is lower than the adapted population range of a hybrid and calendar date is not an issue, replanting may be the best choice.

Decision Guidelines

- Each field has a unique set of conditions and should be evaluated individually.
- Evaluate the existing stand, its health, growth potential and yield versus replanting.
- Early replant decisions should be based on existing population and its potential, while later decisions are based more on calendar date and maturity.
- If replanting early, use adapted hybrids to maximize yield.
- After optimum planting dates, select earlier maturing hybrids.
- If replanting past June 10th, soybeans may be a better option unless herbicide(s) or other practices limit use.

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