Replanting or Late Planting Crops

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Replanting
Replanting when crop damage and stand reduction occurs early in the growing season can be an economically viable option. Replanting decisions, however, are complicated by not knowing what future seasonal growing conditions will occur. Decisions should be based on historic weather trends plus current environmental and economic conditions.

The decision to replant should be made only after evaluating the following questions: Will the economic returns exceed the cost of replanting? What is the most viable crop to plant? Furthermore, carefully consider how current soil moisture, previous herbicide use and the date of replanting might influence the crop or crops to be replanted.

Late Planting
Excessive moisture, poorly drained soils and other factors frequently delay planting beyond the optimum period for yield in North Dakota. Since many of the factors that impact the decision on replanting also impact the decision on how to deal with late planting, this publication also provides relevant information on delayed crop planting.

Appraising Crop Injury, Stand Reduction and Yield Potential
Evaluating crop injury and estimating potential crop yield is the first step in determining if a crop should be replanted. The best possible evaluation of the surviving stand is needed because the critical yield comparison ultimately will be between the suboptimal stand from the original planting date versus a full stand from a later than optimum planting date.

During the seedling stage, injury that results in stand reduction will cause the greatest yield reductions. Leaf loss or leaf burn during early stages has a minimal effect on yield; however, as the crop approaches reproductive developmental stages, leaf damage or loss is more detrimental to yield. An assessment of potential plant stand soon after crop injury occurs is critical to avoid delays if replanting is necessary.

An accurate determination of the existing stand must be made. Stand counts should be taken at random from several areas in damaged portions of the field. Determining stand level may be more complicated than simply counting plants. If seedling emergence is uneven, an evaluation of potential late-emerging plants should be made. If areas in a field are not damaged, they do not need to be considered for replanting. However damage in fields often is distributed randomly throughout a field and this complicates decision making.

In early plant development, a few key structures are indicators of potential plant survival. A healthy root system and seedling emergence tissue are needed during plant establishment (see Figure 1 for key structures). If these structures appear normal and the depth of the seed is not excessive, emergence likely will occur when soil moisture is adequate. Destruction of leaf area on young plants is seldom
Granny Crops

Defoliation Damage (Hail, Wind, etc.)

Prior to jointing

Plant develops new leaves from growing point beneath the soil surface.

Jointing

Plant develops tillers from the crown.

Boot to Maturity

Plant death occurs.

Buds in leaf axils become active and grow to produce new stems.

Figure 1. Effect of injury on grassy crops at different growth stages and on broadleaf crops.

as detrimental to subsequent plant growth and yield as the initial appearance may suggest. If the growing point of the small grain is not damaged and the stem is not broken below the cotyledonary node of broadleaf crops, the plants likely will recover.

During early growth stages, most North Dakota crops can sustain some stand loss without experiencing significant yield reduction. Crops compensate for stand reduction through tillering, secondary branching or increased head number, and increased ear, head or seed size.

Comparison of the estimated yield of the injured crop with expected yield of an alternative crop minus reseeding costs must be considered. Often this calculation will reveal that the present crop stand will be more viable economically than a later replanted crop.

Table 1 shows the population levels of several crops that should be considered minimum stands when deciding whether to replant, assuming the plant population is relatively uniform in distribution. As the season progresses, the yield potential of a newly planted crop is reduced (Tables 2 and 3); therefore, the lower minimum stand values from Table 1 should be utilized as the season progresses.

During early development, the growing point of cereal crops is below the soil surface, making them less susceptible to injury. With this protection, plants can suffer the loss of above-ground foliage without dying.

When hail, frost or similar types of injury cause severe foliar damage, waiting several days after the injury occurs to make an accurate determination of stand reduction is advisable. After this period, new growth on plants with uninjured growing points can be observed as in Figure 1. If no regrowth is observed, the stem of the plant may be cut in half to inspect the growing point.
Table 1. Minimum stand levels of several crops that should be considered acceptable before replanting is done.

<table>
<thead>
<tr>
<th>Crop</th>
<th>% of Normal Stand</th>
<th>Minimum Stand</th>
<th>Units/Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canola</td>
<td>25-50</td>
<td>4 plants/ft²</td>
<td></td>
</tr>
<tr>
<td>Corn: Irrigated</td>
<td>50-60</td>
<td>17,000-20,000 plants/A</td>
<td></td>
</tr>
<tr>
<td>Corn: Dryland</td>
<td>40-50</td>
<td>13,000-16,000 plants/A</td>
<td></td>
</tr>
<tr>
<td>Dry Bean: Navy and Black</td>
<td>50-60</td>
<td>45,000-60,000 plants/A</td>
<td></td>
</tr>
<tr>
<td>Dry Bean: Pinto</td>
<td>40-50</td>
<td>28,000-35,000 plants/A</td>
<td></td>
</tr>
<tr>
<td>Field pea</td>
<td>40-70</td>
<td>3-5 plants/ft²</td>
<td></td>
</tr>
<tr>
<td>Flax</td>
<td>20-40</td>
<td>20-35 plants/ft²</td>
<td></td>
</tr>
<tr>
<td>Safflower</td>
<td>40-50</td>
<td>2-2.5 plants/ft²</td>
<td></td>
</tr>
<tr>
<td>Small Grain</td>
<td>30-40</td>
<td>8-14 plants/ft²</td>
<td></td>
</tr>
<tr>
<td>Soybean</td>
<td>50</td>
<td>75,000 plants/A</td>
<td></td>
</tr>
<tr>
<td>Sunflower</td>
<td>50-60</td>
<td>8,000-11,000 plants/A</td>
<td></td>
</tr>
</tbody>
</table>

The growing point should be white or cream-colored. Darkening or softening of the growing point usually precedes plant death.

When the growing point moves above the soil surface at jointing in small grains and the sixth-leaf stage in corn, it becomes more vulnerable to physical damage.

Indirect Effects of Injury

In addition to the direct effect of leaf loss or stand reduction, indirect effects of crop injury, such as increased weed competition and increased disease potential, should be considered. Damaged crops usually grow slowly until they have recovered, which provides the potential for greater weed competition. Loss of leaf canopy allows additional sunlight to reach previously shaded weeds and may result in additional weed flushes. Wounds from hail, insect or wind injury provide opportunities for pathogens to infect the plant. Resulting diseases may reduce yields or grain quality directly.

Previously applied herbicides may have little remaining activity to control new flushes of weeds. Use of postemergence herbicides (particularly those that normally stress the crop) to control new weed flushes should be delayed on visibly weakened crops until the crop has an opportunity to recover. Otherwise, herbicides that are relatively safe on the crop should be used to control new weed flushes when weeds are likely to become too large to control once the crop has fully recovered.

Areas with no vegetative cover are in danger of soil erosion and stay wet longer because no plant transpiration is taking place.
Replanting Decision

The decision to replant ultimately must be made by comparing the estimated yield of the injured crop with that of a replanted crop. This is quite subjective and each case must be considered individually in terms of time of year, alternate crop choices, previous herbicide use, crop economics and insurance, and other related factors.

Crops replanted late in the season almost always will yield less than those planted at an optimum time. Table 2 shows approximate yield reductions that may be expected from late-planted cool-season crops. Table 3 shows approximate yield reductions that may be expected from late-planted corn, soybean and sunflower. The remaining growing season may be too short for some crops. Table 4 shows options for replanting and the dates by which most North Dakota crops can be planted safely and still produce a useful or marketable product. These dates will vary somewhat depending on the region of the state.

Residues from previously applied herbicides may restrict some crops from being used as a replant crop.

For more information on this and other topics, see www.ag.ndsu.edu

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3M-6-97; 3M-4-09; web-8-15