Technical Bulletin
A publication of the LG Seeds Agronomy Department

Issue 479: October 2019

The Importance of Managing Excess Corn Residue

Scott Dugan, CCA, Technical Team Agronomist - LG Seeds

The past few years growers have made significant progress in overall yields. Whether through hybrid selection, better fertility programs, or higher populations growers have seen yields continue to surpass historical production. Just as grain yields have increased so have the amounts of residue or Stover. These residue increases could also be attributed to the increased use of fungicides, Bt traits, and the use of no-till practices all of which reduce the rate of decomposition and increase the overall amount of residue within a field. As we finish up harvest, let's look at how excess corn residue can affect your next year's crop and how we can manage it.

Soil conservation managements have numerous benefits: cropland erosion control, increased soil permeability, moisture conservation, reduced compaction, more biological activity, and overall soil health. However, excess residue can pose a few challenges for growers especially in corn on corn situations. Excess residue can reflect sunlight and insulate the soil; therefore, keeping the soil more cool and wet during planting. This can lead to germination issues, more prevalent seedling diseases, inadequate seed depth, and poor soil to seed contact, all leading to a non-uniform emergence. This is important because non-uniformity or late emerging plants rarely reach full yield potential and often compete with healthy plants for nutrients resulting in lower yields. These issues can be magnified as growers continually try to push their planting dates earlier and earlier.

There are ways to manage excess residue. First is at harvest, it is important that the combine is adjusted to the proper settings. Also check that the chaff and stalk distribution behind the combine is spread in a uniform manner. This becomes more difficult as the size of your combine head increases. Some combine heads allow for additional options for chopping chaff and stalks which allow for smaller pieces that ultimately break down faster. All these recommendations can help with decomposition plus you have fewer plugging issues with seeding and tillage equipment later.

Next is tillage during the fall and spring. There are several tillage practices: conventional disks, deep chisel, mulch rippers, etc. Vertical tillage is a method that doesn't necessary incorporate the residue into the soil, but it reduces the size of the residue by using narrowly spaced rippled coulters to cut stalks and root balls into smaller pieces at high speeds. Another method is strip tillage which is a combination of no-till and conventional tillage. It is a narrow band of approximately 7" that has characteristics of conventional tillage (loose granulized soil), while the remaining 23" of row area is undisturbed. Also, during strip-till fertilizer is usually applied in the narrow band just under the

seed location allowing for additional nutrients and warmer soils in the spring. Any tillage that incorporates the residue into the soil will increase decomposition rates. Fall tillage allows for more time and therefore will break down residue at a higher rate than spring tillage. Some growers that have cattle will graze or bail stalks to manage residue. In these situations, complete stover removal is not recommended. Remember that the stover contains nutrients that normally would mineralize during a growing season, so an additional fertilizer might be needed to replace that stover if removed completely.

The last opportunity to manage excess residue is during planting. By using planter-mounted devices such as coulters, clearing discs, sweeps, brushes, and rolling fingers growers can remove residue to clear a 10" path in front of the planting units. Again, it is important to check for the proper settings because every field can be different. Disc angles, height, and down pressure all play a role in accurate crop removal. This serves to minimize the detrimental effects of residue in the row area while maintaining the benefits of residue on the remainder of the field.

In summary, excess residue can create a few production issues; the biggest one being a non-uniform stand. With appropriate management, a grower can have the benefits of residue and have a uniform plant stand that will give the crop a great start and an opportunity to reach its full potential at the end of the growing season.

Additional Information:

1. Ward, Ray: Ward Guide: [http://www.wardlab.com/WardInfo/WardGuide.aspx]
2. Corn and Soybean Field Guide; Purdue University Extension, pg. 265
3. Field Crop Scouting Manual "A guide to Identifying and Diagnosing Problems"; U of Illinois Extension