

RESEARCH CENTERS

Increased crop residue provides production, cost benefits

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Soybeans planted into residue left after grain harvest.



Soybeans planted in plot with biomass regularly removed.



Difference in stand persistence between plots. Soybeans emerged better



As field plot operations manager at the Noble Foundation, one of my responsibilities is to maintain a rotational crop system on all dedicated small plot research fields;

another is to conduct small grain variety trials. Residue management is important in these two areas. We conducted a small grains variety trial consisting of 21 varieties with twin plots, which means each variety was planted with two plots side-by-side. All plots were replicated

three times. Prior to hollow stem, both sides were measured for forage production. The biomass was then removed to simulate grazing. As soon as hollow stem was observed (Feb. 18, 2016), we left one plot for grain production and continued to measure and remove biomass on the other. We used a small plot combine to harvest grain samples when ready and left the stubble standing.

This is where the real story begins: after harvest (approximately 15 days), soybeans were planted into the plot area as a cover crop. Soil conditions

were very dry, and temperatures were high at planting. As the drill moved across the field, I noticed each time it passed through a plot with standing straw residue that the drill coulters would have wet soil on them. However, the drill coulters were dry and free of wet soil when the plow passed through a plot with no biomass. I also noticed many large clods were present in the plot with little residue and much fewer clods in the plots with standing residue.

These observations didn't mean much to me at the time, but as the

seed germinated and began to emerge everything began to make sense. The plot with standing residue emerged quicker and healthier, while the plots with little residue had few, if any, seedlings emerge. This leads me to believe the residue protecting the soil offsets the draw on soil moisture, even with the live grain crop pulling moisture from the soil to fill seed. The standing crop provided good protection from the hot sunlight while also helping reduce evaporation loss. There were substantial differences in the stand and persistence, as shown in the picture, which also demonstrates the noticeable difference in residue and the resulting soybean stand.

Some benefits to managing for increased residue include improved water infiltration, reduced labor cost, reduced soil erosion, reduced air pollution and reduced equipment cost. Residue management refers to any type of residue, whether it is left standing or lying down. Depending on the residue density, it could potentially provide some weed control in addition to the other benefits mentioned. ■