NW Panhandle Crop Notes

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Howdy folks. Glad we received those gentle rain showers earlier this week. The few cool, overcast days we had earlier this week may slow the maturity of younger cotton bolls. However, I doubt the cotton crop will experience much delay as warmer weather returns next week. Maturity of the corn and grain sorghum crops appears to be making fair progress. With harvest and eventual cooler weather on the way, fall is an exciting time of the year.

Today's topic below is about the relationship of accumulated surface residue to stored soil moisture, soil properties, and benefits to crops planted in future seasons. As in my previous blog post, I am keeping to the question and answer format. Will occasionally change formats ahead. Stay tuned so you will know when.

Plate 1. 2020 cotton seedings at the 2nd true leaf stage growing in a strip-till setting with considerable corn residue present. Field planted for Replicated Agronomic Cotton Evaluation (RACE) purpose in Sherman county.

Plate 2. 2020 corn at the 3rd leaf stage growing in a no-till setting with consistent ground cover from previous crop residue. General production field located in Hartley county.

I. <u>Are there things farmers can do during harvest to help preserve/build a better soil moisture reserve for spring planting?</u>

Yes, including field management in the weeks and months following harvest.

1. Uniform distribution of biomass or stover across the width of a combine, for example, is important. Equal distribution of biomass plays a role in benefits derived from residue across a field, supports adjustment of implements for possible tillage after harvest and planter operation at the beginning of the next growing season.

2. As much as possible, it is best to avoid harvesting shortly after a rainfall event when the upper soil profile is wet and subject to additional compaction from traffic of harvesting equipment, tractors, trucks, and other vehicles. As pointed out by many researcher's, the tendency for zones of soil compaction winds up being a greater thief of yield and nutrient acquisition than what we are aware of.

3. Engage with conservation tillage which is basically utilizing some form of reduced tillage and related management that supports an economically and environmentally sustainable cropping system. Strip-Till would be an example of this approach whereby standing residue is left standing and chopped residue which serves as a protective mulch remains in place on the soil surface.

4. There are numerous short and long-term positives or incentives if you will, to conservation tillage. One of those is improved soil structure, more soil biological activity, greater soil water infiltration rate and greater soil water holding capacity. These aspects provide a boost to the amount of reserve or stored soil water come the next production season, the one after that and so on.

II. <u>Explain the benefits of maintaining residue or mulch on top of the soil. Do these benefits extend beyond enhancing soil moisture retention?</u>

1. Yes, residue protects the soil surface from WIND and WATER erosion which we typically experience plenty of from planting through early stages of crop growth here in the NW Panhandle. And we can think about snowfall that may happen at some point not long after harvest. With additional residue in place, there is an opportunity to trap significant snowfall where it fell. This helps to insulate the ground for a period, also protects soil surface particles from wind and later contributes needed moisture to the upper profile.

2. Residue or a mulch layer on the soil surface acts like a shade. In other words, it reduces the radiation load and the evaporative demand in winter, spring and summer on water stored in the upper and lower soil profile. Thus, the next and future planted crops will have access to a greater supply of water throughout the growing season. These factors contribute to easing the in-season demand for supplemental irrigation water and pumping cost to Producers.

3. At the time of planting, it is important to begin with adequate soil moisture near the soil surface and throughout the soil profile. Sufficient soil moisture will promote good seed to soil contact at the time of planting. It is possible to assess the soil moisture status with some degree of accuracy by visual observation and feel method; however, calibrated sensors are now available that can be placed in fields for delivery of reliable information on as frequent intervals as desired. This type of information feed can be valuable to growers in that they readily know season long the status of soil moisture in fields below the soil surface where roots are developing and taking up nutrients and water.

4. The benefits of surface residue extend beyond enhancing soil moisture retention. For example, shading of the ground serves to reduce the germination and emergence of weed seedlings which leads to reduced need for herbicide input, whether amount of herbicide or number of follow-up applications required.

5. Additionally, residue GRADUALLY builds soil organic matter (OM). Higher organic matter is better when it comes to water and nutrient acquisition, nutrient use efficiency, overall efficiencies of production, and improved soil tilth. Greater organic matter also equates to additional stored soil carbon and ensures an adequate supply of micronutrients e.g. Zn, Fe, Mn, Mg, and Mo.

6. There is an opportunity for Producers to achieve greater profitability by establishing, maintaining, and planting directly into good residue cover. Additional information about this topic is available 24/7 electronically through AgriLife Extension and USDA-NRCS among other sources. One example is of strip-till systems working well for this purpose in the High Plains. Accumulated residue serves to protect cotton seedlings from harsh environmental conditions that can delay development by damage to plant foliage or even killing the plant due to terminal bud damage. Abrasion due to movement and impact of soil particles (especially sand) is a big issue during certain seasons for growers in the Panhandle of Texas.

7. Maintaining greater residue on the soil surface likely means less tillage involved which helps to reduce input costs associated with irrigation, labor, and fuel.

Remember, it takes time (repeated seasons) to see improvements in physical, chemical, and biological soil health components. Staying the course and system refinements really do count.

This concludes the first of a two-part discussion on residue management. More information will be posted soon. Enjoy the fall season and be safe.