

Dealing with Corn Stalks Part 2

This article discusses possible solutions to reducing corn stalks in surface water. An immediate solution is to keep corn stalks firmly attached to the soil at harvest by raising the corn headers. Excess corn residue flowing through the combine gets chewed up and is less likely to be spread evenly and unattached residue may float off the field. New harvest innovations are strippers which strip corn ears and soybean pods from the plant yet leave the stalks firmly attached to the soil.

A farm myth is that GMO (genetically modified organism) corn decomposes slower than Non-GMO corn. A study by Dr. Peter Thomison, OSU Corn specialist, shows that there is no difference in the rate of decomposition between GMO and Non-GMO corn. Farmers chop, turbo-till, or disk corn stalks to increase decomposition and these practices have no effect on corn stalk decomposition. Chopping, turbo-tilling or disking corn stalks may actually increase the removal of corn residue from the field by decreasing soil attachment, increase surface compaction, decrease water infiltration and increase field flooding.

Corn stalk decomposition is dependent on three major factors: soil temperature, soil moisture, and fungal decomposition. Why are corn stalks so difficult to decompose? There are four major reasons: 1) Conventional fields are dominated by bacteria microbial communities rather than a healthy balanced mix of bacteria and fungus, 2) Soil that are compacted and too wet for optimal decomposition, 3) Farmers may be overusing fungicides which decrease fungus populations, and 4) Late maturing corn harvested late in the year results in lower soil temperatures and decreases the time for corn stalk decomposition. Ecological or ECO Farming systems use fewer fungicides and have a healthy balance of bacteria and fungus to decompose corn stalks rapidly if soil temperatures are warm, soil moisture is adequate, and there is adequate time for decomposition before winter. The real solution is higher soil temperatures and adequate moisture to stimulate fungal populations to decompose quickly the lignin in corn stalks.

A major change that farmers need to adopt is to plant earlier maturing corn and soybeans so that the soil temperature is warmer at harvest for faster corn stalk decomposition. Harvesting early maturing corn and soybeans allows cover crops to be planted in a timely basis in September which allows the crop to become firmly established before winter. Most cover crops need 60 to 90 days of growth before winter. Live covers promote healthy microbial communities and maximize invertebrates (earthworms, beneficial beetles, springtails) for optimal corn stalk decomposition

OSU research by Dr. Peter Thomison and Ohio Soybean Specialist shows that optimal corn and soybeans yields are related to the timing of soil moisture more so than crop maturity. Early maturing corn planted in early May benefits from timely late May and June rains while corn that begins tasseling in July and August may be hurt by dry or hot soil conditions. There may be a slight advantage to later maturity corn and soybeans due to increased photosynthesis, but this advantage may be small compared to improved weather conditions from early planting, early harvest, and optimal soil conditions.

The benefits of early maturing corn (<102 days) and soybeans (< group 2.0 maturity) are 1) lower crop moisture at harvest (1-3% points), 2) easier dry down (warmer temperatures) due to harvesting in September versus cold air in November/December/January, 3) less chance of wet soil conditions and soil compaction, and 4) possible crop premiums for early harvested corn or soybeans. If the yield is the same or comparable for early and late maturing corn and soybeans, early maturing crops offer many benefits to farmers. Pick the highest yielding early maturing corn and soybean varieties based on current agronomic research to maximize crop yields. Also pick varieties that are disease resistance.

Using ecological or ECO Farming methods increases the microenvironment for maximum crop decomposition. Warmer temperatures and healthy soils have a balance of fungus and bacteria which allow corn stalks and soybean residue to decompose faster than later maturing harvested crops. Increased microbial life along with healthy invertebrates and earthworm populations increases decomposition. If heavy rains occur, the increased water infiltration and increased soil-water storage decreases water runoff and flooding potential, and the cover crops restrict corn stalks from floating away.

Farmers have several options to decrease corn stalks and corn residue from floating off fields. Some options are relatively simple to implement while other options require a long-term management plan to implement. With some changes in farming practices, the incidence of corn stalks/residue in surface ditches may be reduced.