

**Soil Erosion Enhancement Activity – SOE03 - Continuous No-Till
(Organic System)**

Research at the Kellogg Biological Station (KBS) by Dr. Dale Mutch and associates from Michigan State University used a 3 year rotation with corn fall seeded rye cover, soybeans and winter wheat with red clover (frost seeded) in a no till and tilled organic seedbed. Here is our best guidance for No-till in an organic corn, soybean and wheat crop rotation based on our observations through 2009.

Our success with this system was best in years we had adequate water from planting thru harvest. Supplemental irrigation water should be available to provide moisture when excessively dry soil conditions occur at planting thru harvest. The addition of a rye cover crop and red clover frost seeding in the wheat can deplete the soil of moisture and cause stand failure. Without a good stand we have observed poor yields in our corn-soy-wheat plots at KBS. Irrigation can be a safety net in dry weather in this system.

Corn after winter wheat can be challenging for no till. The residue makes it difficult to get good soil to seed contact. Residue management begins at harvest. Wheat chaff and straw needs to be spread with a Chaff spreader attachment on the combine operating at harvest to uniformly spread the chaff and residue. If the combine header width is greater than 15 feet a chaff spreader should be added. If a chaff spreader is not used at harvest there are two options for managing the residue: 1) Mow the windrow with a bush hog or rotary mower to spread the residue more uniformly or 2) Bale the wheat residue for straw. Try to minimize the amount of grain leaving the back of the combine to prevent volunteer wheat by setting the sieves and air on the combine correctly to prevent blowing wheat seed out the back of the combine.

For no till planting corn in wheat stubble a fall strip till system may be used to incorporate compost or K-Mag in the row area on clay soils and help warm up the soil for early spring planting. If volunteer wheat emerges, a crimper roller may be needed to kill and suppress the wheat cover crop and weeds. An alternative is to use a flamer/burner after the corn emerges but before corn growth stage to control weeds and volunteer wheat. It might be wise to use a flamer when wheat residue is moist to prevent catching the stubble on fire.

Seed winter rye cover into corn by over-seeding with an airplane or a highboy from August 1st to mid-September. The following spring a crimper roller or mower can be used to kill the rye when it is fully pollinated or in the soft dough stage. No till soybeans can be sown into a Rye cover crop and successfully emerge if the rye cover has not dried out the seedbed. Additional water may be needed if drought conditions exist at planting to insure an adequate stand of soybeans. The mulch from the rye cover does a good job of weed suppression until soybean canopy closure.

Michigan Enhancement Supplement

After soybean harvest winter wheat can be no till drilled into the soybean residue. To fix nitrogen for the next corn crop try seeding a summer annual legume such a crimson clover or bin run soybeans. Crimson clover or soybeans will winter kill and provide some Nitrogen for the next corn crop. Sow perennial legumes such as red clover or white Dutch clover with caution after wheat harvest because both can be difficult to control with crimping and rolling or mowing the following spring. Also, in a dry spring, red clover or white clover can compete for moisture needed to emerge and sustain corn growth. Therefore, unless irrigation is available crimson clover or bin run soybeans would be the preferred cover crops to suppress weed growth after wheat harvest and fix nitrogen for the following corn crop.

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