TIMING OF COVER CROP TERMINATION FOR THE SOUTHEAST

Several posts on this website give considerable detail about using cover crops as part of a management system to sustain crop and soil productivity. They are:

> "Cover Crops", a White Paper that provides guidelines for most phases of cover crop production and management; "Cover Crops", a blog post from Aug. 2015; "Cover Crops: one more tool in the fight against herbicide resistance"; and "Cover Crops and Corn Stover Removal", a blog post from Oct. 2015.

A Jan. 2016 article published in Crop, Forage, & Turfgrass Management (PMN) authored by Balkcom, Duzy, Kornecki, and Price at the USDA-ARS National Soil Dynamics Lab at Auburn, AL and entitled "Timing of Cover Crop Termination: Management Considerations for the Southeast", gives a concise summary of points that should be considered for the timing of cover crop termination in the Southeastern US.

Warmer winters in the Southeast extend the cover crop growing season, thus allowing greater biomass production compared to more northerly regions of the US. This results in potential risks associated with increased biomass production that can be reduced with proper timing of cover crop termination.

Planting a cover crop as early as practical in relation to the summer crop's maturity is essential to maximize cover crop biomass production. This in turn will affect its resulting growth and the decision of when to terminate in the spring.

> Planting cover crops on a particular date and then terminating them preceding an early-planted crop such as corn will result in less biomass than will result from their termination at a later date preceding a later-planted crop such as soybeans or cotton. In fact, terminating a cover crop preceding an early-planted corn crop may result in a level of biomass that fails to meet the standard for a high-residue cover crop.

For nonirrigated summer crop production, a cover crop should be terminated early enough to allow soil moisture replenishment before the intended planting date of the summer crop. If the cover crop is still actively growing or has been terminated just prior to planting the summer crop, rainfall before planting may not be sufficient to ensure optimum germination and early growing conditions for the summer crop. Also, residue remaining from a cover crop that is terminated sufficiently ahead of summer crop planting will improve infiltration and storage of rain water that is received after its termination and before planting the summer crop.

The climate of the Southeast shortens the persistence of surface residues remaining after cover crop termination. This is especially so for residues of leguminous cover crop species vs. residues of cereal cover crops. Thus, termination of the cover crop ahead of summer crop planting should consider whether or not the cover crops are predominately legumes or cereals. In essence, termination of legume cover crops can occur later than termination of cereal cover crops in relation to an intended planting date of the summer crop.

Nitrogen (N) management should be considered when timing cover crop termination.

> Residues from legume cover crops that have a low C:N ratio (<24:1) release or "mineralize" N quickly as they decompose and thus limit the time that these residues remain on the soil surface. This results in reduced benefits from the rapidly decomposing surface residue. If the summer crop is not actively growing to capture the mineralized N, then this N will be lost.
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> Delaying termination of legume cover crops as long as possible will result in increased biomass production, and will improve the likelihood that cover crop N release and uptake of N by the summer crop will coincide.
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> Residue from high-biomass cereal cover crops have a high C:N ratio (>24:1), and the small amount of N that is mineralized during their slower decomposition likely will be immobilized or consumed during the decomposition process. However, these residues with a high C:N ratio will persist longer than those with a low C:N ratio, and thus surface residue benefits will be enhanced.
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> Delaying termination of cereal cover crops will result in increased biomass production, and increase the likelihood that resulting residues will be sufficient to provide the soil quality benefits derived from their persistence. However, the immobilization of N during cereal cover crop decomposition may necessitate that additional early-season N be applied to a following non-legume summer crop.

Cover crop residues act as a mulch, and this mulch and the possible allelopathic compounds that are released during their decomposition may inhibit weed seed germination and subsequent weed growth. In general, the more the cover crop biomass/residue, the more likely its negative effect against weeds. To realize the optimum benefit from the potential allelopathic effect of cover crops against weeds, their termination should be timed to allow for maximum production of biomass while also allowing sufficient time for rainfall to occur before planting the summer crop.

Cover crop termination should occur sufficiently ahead of planting the summer crop to allow for the residue to become completely dry and brittle. This will allow planting equipment to cut through the residue and prevent "hairpinning" that can result in insufficient seed-soil contact for optimum emergence of the summer crop.

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