Use of Cover Crops in Hardwood Production

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Cover crops are as essential a practice in hardwood production as in pine production or any other nursery operation. Without proper cover crop rotation in a nursery plan, we open ourselves up to an array of problems: more diseases, wrong pH, more weeds, reduced fertility, and less downward percolation of soil moisture due, in part, to compaction.

Proper cover cropping is probably the single most important thing we can do to enhance seedling health and vigor. Without reasonable organic matter content in the soil, we spend more on fertilization, disease control, and irrigation. Soil tilth, cation exchange capacity (CEC), and moisture retention begin to be problems. This in turn leads to pH, fertility, and disease problems, which in turn lead to poor root systems and poor seedling quality. Organic material in the soil is in a constant state of decay. This means it must be renewed constantly by the addition of plant residue. It is the main source of soil microorganisms, thus keeping biochemical activity constant in the soil. We keep organic material renewed in 2 ways: (1) by the addition of plant and animal residue, and (2) by the growing and maintenance of cover crops.

The program we use in cover crops is quite simple. On a 2:2 rotation (2 seedling crops, then 2 cover crops), we start with corn in the first spring following seedling lifting. This is followed by winter wheat and then by sudex, which is cut under with 2 in (5 cm) of cotton gin trash in August and September in preparation for fumigation in the fall. Sunflowers can also be a very good cover crop, but can also become weeds if we aren't careful. Many cover crops can be harvested and sold. They can also provide a continuous source of seed for the next crop.

The soil at Columbia Nursery (Columbia, LA) and Monroe Nursery (Monroe, LA) are both silt loams. Monroe Nursery has soil that is a little tighter, with shallower topsoil and heavy clay subsoil. The high lignin content and deep root systems of the mix of cover crops work very well in these soils. These help in the granulation and maintenance of the soil, not only chemically and biologically, but physically as well.

Cover crops, and thus organic material, are possibly even more important in sandy soils due to its lack of capacity to absorb and hold sufficient moisture and nutrients. The only way to improve the soil structure is with the addition of organic matter. Organic material increases the ability of the soil to retain nutrients, acts as a binding agent, and increases its water holding capacity.

Cover crops act as weed control in 2 primary fashions. Cover crops shade out any potential weeds; it is best to over-seed all crops to assure an adequate stand and full coverage to prevent any possibility of a weed problem. In addition, a wider range of chemicals can be used on cover crops to control a wider variety of weeds. This helps prevent a particular weed from becoming resistant to a chemical and allows better control of historically hard-to-handle nursery weeds, such as yellow and purple nutsedge, spurge, primrose, and morning glory. This is especially true in a hardwood nursery where our chemical controls are somewhat limited. Also, with a 2:2 rotation, chemicals that may have a little residual can be used in the first year after seedlings without having an effect on the next seedling crop. If at any point there is a weed problem in the cover crop, it should be cut under, treated, and replanted. It is very important that a weed control program be utilized along with all cover crop rotations.

Everyone knows the advantages of high organic matter content in the soil. Low organic matter creates a myriad of problems. It is just so much easier to grow a crop with an acceptable organic matter content. It takes less irrigation, less fungicide, less fertilization, less fumigation, less tillage and can, when done properly, take less herbicide and manpower. With proper rotation of cover crops, high organic matter content can be obtained and sustained. A 2:2 rotation is preferred because it allows 3 different crops before every seedling crop: corn and sunflower for high lignin; wheat for deep penetrating roots; and sudex for lignin and mass. This rotation also allows us to work on any field with problem areas for 2 years before going back in with seedlings.

If for any reason a cover crop is not taken just as seriously as a seedling crop at a nursery, it would be wise to readjust the thought process and consider the advantages of a good, well maintained program.