THE USE OF CORN AS A COVER CROP IN FOREST TREE NURSERIES

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The corn cover crop observed at Edwards Nursery during the 1964 Nurserymen's meeting has aroused considerable interest. It is gratifying to know that some of our work is observed and is of interest to others.

Before entering into the various results obtained from a corn cover crop, I feel that a short explanation should be made as to why corn.

From 1938 until 1958 the forest tree nurseries of North Carolina operated on both receipts and legislative moneys, the same as most State nurseries operate today- however, during the summer of 1957 it was decided that since the nurseries were producing a saleable product they should be able to pay their way. Therefore, no additional state appropriations would be forthcoming, except for capital improvements. As most of you know, it was shortly thereafter that the Soil Bank Program was discontinued which meant we were strickly on our own.

Up until this time we experimented with various cover crops, such as soy beans, sudan grass, sudex, rye, and others, all of which were plowed under prior to flowering or at the height of their vegetative weight in order to give us the greatest amount of nitrogen for the next crop.

Perhaps this is true; however, our soil analysis did not show it. Following several years of no increase in organic matter, our foreman requested permission to plant corn and harvest the grain as a source of income. This sounded reasonable and the first crop was planted the summer of 1963. Since we cannot acquire pine needles at a reasonable cost, we follow the same reasoning and plant winter rye, which is also allowed to mature. The grain is harvested and sold and the straw is baled and used as a mulch on white pine. The stubble is plowed in and seeded with a late summer cover, such as sudan or sudex.

This year, we are following our rye with corn planted with a grain drill in hope of achieving much more organic matter per acre than from sudan or sudex. The corn will probably not mature but will be plowed under at the latest date possible in order to plant the winter rye.

Certainly you must be wondering whether or not we grow any seedlings. The rotation I just described is for our southern pine areas which are now on a 1-3 rotation (1 year in trees, 3 years in cover). Our white pine areas are on a 2-1 rotation (2 years in trees, 1 year in cover). The reason for this being that some of our soils are of

such a texture and well-drained that we can grow a 2-year crop, such as white pine, without a winter mulch. Anyone who has raised white pine knows that the elimination of this one operation means a considerable savings.

The corn is usually planted at the rate of 1/4-bushel per acre depending on the kind, along with 150 pounds of available nitrogen per acre. Our yields have not been fantastic partially because our pH is around 5, corn preferring a pH of around 5.5 to 6.0. It is obvious from the soil analysis record that the pH drops slightly with our rotation and that a small amount of lime will be needed.

I would like to mention here that as far as I know no two nurseries can operate alike, what is beneficial for one may be detrimental for another. In fact, we have not realized any significant increase in the percent organic matter as a result of growing corn or any other cover crop. However, there are several side effects that do not show up in the soil analysis as recorded below:

Compartment	Year	pH	Organic matter (percent)	Crop
"A"				
	1957	5.8	0.3	White pine
	1959	5.3	0.6	White pine
Sand - 81%	1962			White pine
Silt - 12%	1963			Corn
Clay - 7%	1964	5.3	0.3	Loblolly
	1965			Corn
	1966	4.8	0.4	Corn
"C"				
Sand - 85%	1959	5.3	0.4	White pine
Silt - 9%	1962			Soy beans
Clay - 6%	1963			Corn
	1964	5.3	0.4	White pine
	1965			White pine
	1966	4.8	0.5	Corn

Compartment	Year	pH	Organic matter (percent)	Crop
"H"				
	1961	5.1	1.2	Sudan & Rye
	1962			Loblolly
Sand - 64%	1963	5.1	1.1	Rye & Soy beans
Silt - 27%	1964			Corn, Sudan, Rye
Clay - 9%	1965			Fallow & Rye
	1966	5.0	1.1	Rye & Corn

One is that the corn cover pays its own way even though we must not only purchase our seed and fertilizer, but must also pay to have the corn planted and harvested; in fact, some years we must pay to have the grain dryed before it can be sold. We all know that corn is one of the better indicator crops and for this reason alone it is a worthwhile cover.

Another effect not shown by the soil analysis is that corn residue can be seen in the soil as much as 2 years after being plowed under. All other covers tried, as well as sawdust and shavings, are not obvious after 1 year. Apparently, the reason that the soil analysis does not show any increase in organic matter is due to our method of taking soil samples. A standard soil sampling probe is used which does not pick up the pieces of corn stalk which, as we all know, are rather irregular in shape and size.

One of the most important effects of growing corn is weed control. With the modern methods of growing corn we are realizing a definite decrease in weed population. This is brought about by the use of 80 percent atrizine at the rate of 3 pounds per acre which is sprayed on the ground following the planting of the corn; the cost is 52.75 per pound applied. The results are outstanding, absolutely no weeds, the corn is never worked which conserves moisture and labor. My Soil Physics Professor told us 15 years ago that corn should not be worked in order to conserve moisture, at that time we did not have atrizine. Now, if we could only find a chemical that would do the same for our seedbeds.

CONCLUSION

At this time, it is too early to form any conclusions as to the beneficial effects of a corn cover crop; however, we feel that it is as good or better than any crop we have tried and certainly it pays its own way. Other factors that do not carry a direct monetary value

but are very important is its ability to indicate soil nutrient deficincies in the organic matter that is accumulated, the reduction of weed populations, and the astonishing fact that no disease has occurred in the nursery following 10 growing seasons, corn being used as a cover the last 4 years.

During the next 2 years, we will endeavor to take more thorough soil samples and try to analyze more closely the results of a corn cover crop.