

PENNSYLVANIA MASTER CORN GROWERS ASSOCIATION

Between The Rows

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mented that continuous corn, for example, can degrade the soil structure, which is the soil's ability to form granules and have good "tilth." It is also known that intensive tillage can reduce soil structure and "burn up" organic matter in the soil by introducing oxygen

in the soil.

Tillage can also reduce earthworm populations. We also know that when soils are intensively cropped and few crop residues are returned to the field, organic matter and other soil quality factors will slowly decline.



CORN TALK NEWS

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In addition, traffic on soils with heavy manure equipment and silage wagons can cause compaction, which is not always overcome with subsequent tillage operations.

This summer I visited one farm where the corn "just doesn't grow like it used to." Unfortunately, that hasn't been the first time I heard that comment recently. The farmer proceeded to tell me about his system. The two fields behind the barn had been cropped to corn silage for the last 20 years or so. Each fall or spring they received a healthy dose of liquid manure and were chisel plowed, disked, and planted.

Corn growth has been uneven, weed pressure heavy, and the field has a healthy dose of corn rootworm beetles. Heavy rains seem to run off more than infiltrate. He has been reluctant to rotate because his hay fields are hilly and his conservation plan is very limiting in terms of the amount of corn that he can grow there.

As I thought about the problem, I began to realize that there were many factors here that could contribute to a decline in soil quality — continuous corn, intensive tillage, no cover crop over the winter, and frequent heavy traffic on the fields. Even the manure he was applying — a low-organic-matter, nitrogen-rich slurry would have a lot less beneficial effect on the soil organic matter than the solid manure his grandfather applied to the fields a generation before. On top of those factors, pest problems aggravated by continuous corn were building and reducing the crop's ability to compensate for the lousy soil conditions.

There are a lot of fields in Pennsylvania which get treated in a similar fashion and still grow decent corn. This suggests to me that soils vary somewhat in their ability to tolerate some of these abuses. Some of the deep, loamy, very productive soils in the southeast part of the state, for example, have been cropped to corn for more than 30 years continuously and still produce top yields. My observations would indicate the potential for problems would be

most on soils that are shallower or have been eroded and are a bit "clayey" in texture.

Lets discuss the options I suggested to the farmer I met earlier this summer.

It would be great if he could rotate the field into hay for a few years and possibly no-till his corn into existing hay fields to meet conservation requirements. Another option might be to get a rye cover crop established immediately after silage harvest. A good crop of rye in the fall could help loosen the soil, build soil structure, and help to return some organic matter to the soil. This may be enough to turn the situation around. To go one step further, I'd recommend eliminating the tillage for corn planting as much as possible and applying the manure in early spring, killing the rye early, and planting when the soil is fit. This would eliminate tillage and should help to improve soil tilth and soil organic matter. We may have to compromise here and spread our manure on the surface, but the rye cover and N accumulated from the cover crop should help to offset the N lost from a surface manure application.

He could also consider irrigating manure on the fields. This would eliminate the traffic from manure hauling and the resulting soil compaction. Other possible solutions could also be developed to address this problem, but almost all require some additional expense or compromises.

I've seen a number of beautiful corn fields this year and many of them in cropping systems that include factors such as short corn rotation, irrigating manure, early planted cover crops, or more reliance on no-tillage.

So, it is possible to avoid soil problems with some conventional techniques.

If you think you are encountering soil quality problems, consider addressing them by eliminating one or more of the factors that we know is associated with this decline — continuous corn, traffic, lack of crop residue, or intensive tillage.

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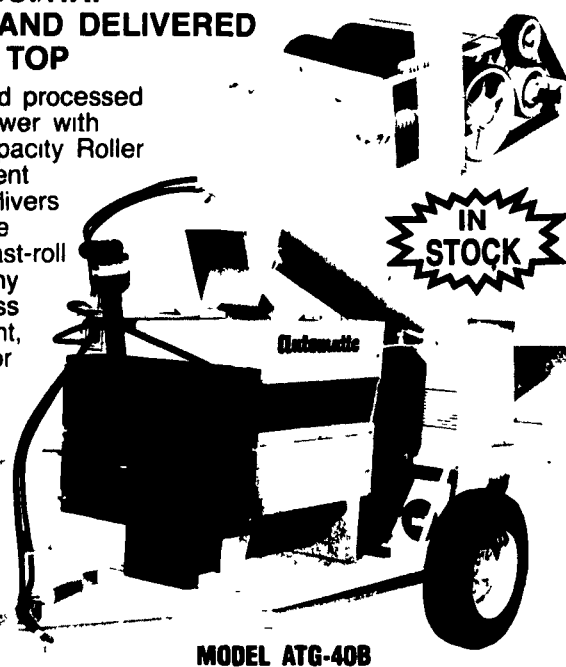
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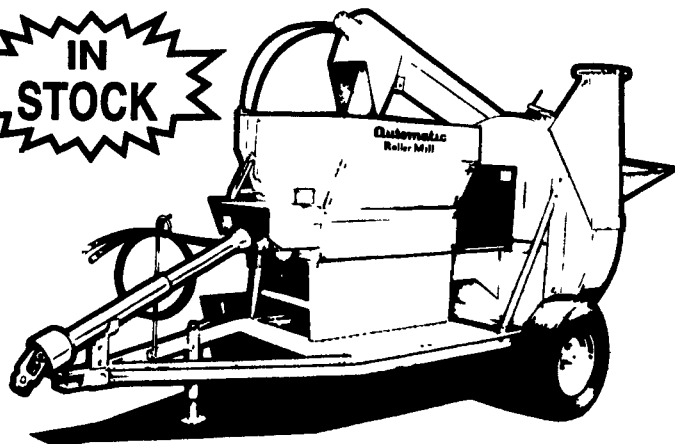


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