

Manitoba Soil Fertility Facts

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October 3, 2012

Is corn residue decomposing slowly? It is the lack of heat not lack of nitrogen.

Corn harvest is upon us and already growers are exercising their numerous options in dealing with corn stover residue. The high levels of crop residue produced by corn can pose problems in following crops if they leave the soil wet and cold at seeding, not to mention planter operation challenges. Conversely, in a dry year, this cover does conserve scarce moisture.

Each year I am questioned about applying nitrogen to corn stalks to accelerate their breakdown. This practice is not supported by research.

There is no doubt that corn stover is slower to decompose than residue of most other crops. The carbon:nitrogen (C:N) ratio is about 80:1 and 3 t/ac of residue may remain. This is about double the residue load of cereal, canola or soybean straw. And plant breeding for improvements in stalk strength and the occasional fungicide applications may keep those stalks persisting longer.

Do these high loads of high carbon:nitrogen residues require more nitrogen in the fall to decompose? Research in Ontario in the late 1970's indicated that as long as the corn crop was fertilized initially in the spring with enough nitrogen for good yield potential, then sufficient nitrogen remained for orderly decomposition of the residue.

More recently, Wisconsin researchers have looked at fall nitrogen application to corn stover and residue breakdown (Figure 1). The nitrogen made no practical difference in stover decomposition or in resulting spring soil temperatures. They concluded applying nitrogen in the fall was not justified since it did not contribute to residue breakdown – and was subject to overwinter loss of N.

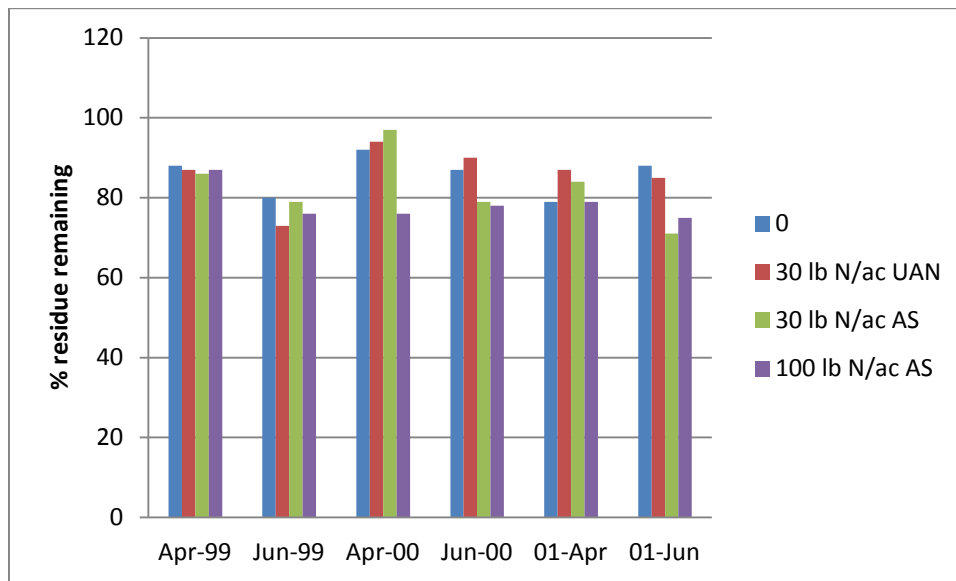


Figure 1. Corn stover remaining in April and June for fields receiving different rates and sources of nitrogen the previous fall (nitrogen sources were UAN 28-0-0 and ammonium sulphate 21-0-0-24S). Bundy and Andraski, 2002.

It is the lack of suitable conditions for microbial activity, specifically heat and moisture that limits decomposition of corn stover, not the lack of nitrogen. Usually corn harvest is late and conditions are too cool in the fall to encourage microbial breakdown. Harvest is early this year, but the lack of moisture may be the factor limiting microbial activity factor.

So use whatever means you need to work the corn residue to prepare next year's seedbed. Providing you have fertilized your corn crop for good yield potential last spring, no more nitrogen is justified. And if you are applying fall nitrogen for the 2013 crop, you can improve fertilizer efficiency by placing it in bands beneath or away from that corn stover. Limiting the exposure of that nitrogen fertilizer to the corn stover will reduce immobilization and leave more for your crop.

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