

Balancing the basic properties of soil

Lawrence Andres has not bought a pellet of fertilizer for 20 years, relying solely on livestock manure and soil management to ensure adequate nutrients for the crops on his family dairy farm. Anticipating disbelief, he quickly adds that "I wouldn't do it any more if it didn't work."

Andres was the speaker at the "Breaking the Barriers" conference workshop on nutrient recycling. He maintains that by preventing the nutrient losses in manure, and subsequently in the soil due to poor management, livestock farmers can eliminate the need for commercial fertilizer applications.

"There is a present tendency to over-emphasize the chemicals in the soil. It is the biological activity, however, that comes first and makes the physical and chemical aspects work properly," he says. He added that biological activity includes the fungal, microbial and insect activity in the soil.

The biological activity is the most important component in producing the humus-clay mixture, the nutrient base for crops, which is also the most susceptible to erosion by wind and water.

Andres says that there are many techniques that help preserve productive soils without amendments but that proper management is also a corollary. Green plowdowns are useful in building soil fertility, but they must not be completely buried otherwise there is insufficient air for complete breakdown of the plant matter into humus. Likewise, improper drainage leaves too much water in the soil, excluding air and light from the decomposition process.

Diversity

Crop diversity is essential, with high residue crops offsetting the effects of high yield cash crops which deplete the humus. Andres gave rye as a good example of balancing a rotation because it is a nutrient stabilizer, storing nutrients that other plants can't use in its large root mass and abundant straw.

Manure should never be spread onto bare ground without some form of plant material to soak up the volatile nutrients which will otherwise be lost. He says that it's better to spread the manure on a standing crop than onto stubble which is laying down. In the first case, the manure will quickly sink into the soil, where it stays moist and the worms can draw the nutrients down; if left on top of the stubble, the manure will dry up and become inaccessible to the worms, eventually leaching out of the soil with the rain. When

spreading on stubble, the best solution is to incorporate the manure immediately afterwards.

Andres wants the "W" word taken out of farming; weeds, he says, are only herbs in another form and that they pick up nutrients, stabilizing them, at the very worst.

He said it's better not to have them because it is a sign of over-fertilization but they do not have nearly the consequences on crop productivity that is commonly claimed.

Andres closed by saying that improved manure management is an educational process that will lead to improved economical and ecological results on farms. Legislation by governments, he says, will only make farmers feel further repressed and fight against imposed change. If regulations are to be introduced, such as the banning of winter manure spreading, then governments must provide the incentives for better manure management through grants for year-round manure storage facilities.

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