Boron studies in Del.

NEWARK, Del. — Delaware's humid weather and sandy soils create ideal conditions for boron leaching and crop deficiencies. Given the potential for leaching, scientists and area farmers have been puzzled by the frequent failure of corn plants to respond to added boron. Donald Sparks, a soil chemist at the University of Delaware Agricultural Experiment Station, thinks the reason may be because organic matter is providing the missing nutrient.

To gather basic data on the behavior of boron in mid-Atlantic coastal plain soils, he and his advisee, master's degree candidate Clare M. Evans, looked at the way boron is bonded to and released from seven different Delaware soil types. Sparks says they undertook their study because so little is known about the behavior of boron in sandy soils.

They found that the adsorptive or bonding capacity of this highly soluble crop nutrient is related to the clay and organic matter present in the soil, and that high organic soils have a greater ability to retain boron than those with low humus levels.

"Corn doesn't require much boron," Sparks says. "It's possible that even the small amount of organic matter in Delaware's sandy soils is enough to give plants what they need."

He says he knows of only one other study on the kinetics of boron in the soil. That concerned only desorption (release from soil particles) and was conducted in California where too much boron in sometimes a problem. On sandy East Coast soils like those on the Delmarva peninsula, the difficulty is determining whether or not a deficiency exists.

"We haven't established that yet," says the scientist, "but Ms. Evans' work gives us a start. When we don't get a response to added B, we need to know why."

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Area farmers who grow corn under intensive management – high plant populations and irrigation – probably would benefit most from this information. Boron, like other micronutrients, is expensive, yet producers feel they need to apply it because of its leachability and the fact that they are striving for maximum yields and can't risk a deficiency.

Evans presented a paper on this research during the national meeting of the American Society of Agronomy, August 14-19, in Washington, D.C.



