

SRN. Slow-release N sources do not load up soil solution with nitrate such that extensive leaching can occur. For these reasons, turf is one of the most environmentally-sound crops that can be grown.

Q: Sometimes you feel like you cannot win. We have high pH conditions and have been using elemental sulfur to gradually lower (or at least stabilize) that 7.5+ number. Now, I read where a professor of agronomy at Ohio State is raising the flag on programs like mine. He says sands with high CaCO_3 content (and a subsequent high pH from 7.5 to 8.5) can create problems when sulfur is added to them. The sulfur dissolves the CaCO_3 , allowing it to migrate down in the profile. The result is a caliche layer with a high pH. He says it's almost like cement. Should I quit using sulfur? Which is worse — a caliche layer or high root zone pH? (IOWA COUNTY)

A: Is your high pH the result of using a calcareous sand to begin with or the result of several years of irrigation with water high in calcium and magnesium? If the latter then you

need not worry. You'll be long gone before the quantities of CaCO_3 required to form a caliche (CaCO_3) layer develops from irrigating with hard water. On the other hand, if the sand used during construction or for topdressing contains several percent of CaCO_3 , the main prerequisite for caliche formation is in place. Whether or not or when formation of the layer will occur, I can't say. Literature does tell us though that caliche becomes hard and "almost like cement" only if allowed to dry. By definition, caliche is a soft, friable CaCO_3 -dominated layer in soils of low rainfall regions. Indications are that soil must start out with a substantial CaCO_3 content and virtually no leaching must occur for many years before a caliche layer begins to develop.

I've not seen any evidence of formation of caliche layers in the putting greens I've examined. I have, however, found accumulations of iron oxides cementing sand grains together and starting to form physical barriers to turfgrass root development.

Q: I'm a dedicated Milorganite user and, quite frankly, have no intention of changing. But it seems more and more companies are "getting into" the organics. A colleague is quite happy with a product called "Sus-tane". Yet another used an organic (from poultry manure) and the material was disastrous — bad odor and even worse physical properties. Rumor has it that one of our major national plant food companies is developing a line of organics, too.

What do you think about all this? Is it just another bandwagon everybody is climbing aboard or is there merit to these kinds of products? Won't Milorganite always stand alone? (GREEN LAKE COUNTY)

A: Several forces are at work here. You have the public sector push toward use of "natural fertilizers" becoming the answer for some major disposal problems confronting the poultry industry and a few others with organic wastes. In the midst of this, considerable progress has been made the past few years in developing large-scale composting technology. Thus, all the ingredients

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