

Some conditions require more phosphate

MADISON, Wisc. — Farmers may improve yields by applying additional phosphate on soils already high in phosphorus, says E.E. Schulte of the University of Wisconsin-Madison Soil Science Department.

"Though a soil may have a high amount of phosphorus in it, farmers should consider row application of additional phosphate under certain soil conditions," he states.

Added phosphate can help in soils that are cold at planting time; soils with a high-phosphorus-fixation capacity; and acid soils, explains Schulte. It can also aid plants with shallow roots, he adds.

"Recent tests have shown that row phosphorus application can increase yield if done correctly," he remarks. "This, of course, can put extra money into farmers' pockets."

"Though these experiments were done with dry fertilizer, research shows that similar results can be expected from fluid fertilizer," Schulte says.

Phosphate in fluid fertilizers is 100 percent water soluble and more readily available for plant uptake when applied as a solution, compared to dry fertilizers which can be as low as 14 percent. Fluid application also provides the farmer with exacting formulations and easier handling for timely application.

Cold soils

Row-applied phosphate is especially helpful in cold climates or during early spring planting, notes Schulte.

"Roots develop slowly in cold soil," he says, "so a high concentration of phosphate close to the roots will help increase phosphorus intake."

"The additional phosphate will give the plant nutrients that are otherwise slow in coming under these soil conditions," he remarks. "As the soil warms, roots will then draw from the phosphorus already there."

Also, adds Schulte, cool soil slows down the micro-organisms that break down organic phosphorus in the crop residues and soil organic matter.

He points to a test run recently in Marshfield, Wisc., where corn was planted early in the spring in 54-degree temperatures in high-test phosphorus soil. Compared to corn

where row-applied phosphorus was not added, corn with additional phosphate showed increased yields from 15 to 34 bushels an acre.

"This is important to farmers who need to plant early to get the most from short growing seasons," says Schulte, "and for those in the South who doublecrop."

"Farmers may want to use more phosphate on soils that warm slowly later in the spring because they retain water or are clayey," he notes. "Soils on northern slopes also warm later because they don't receive direct sunlight."

He remarks that phosphorus application could also help in high phosphorus no-till fields where crop residues retain water and

shade the soil. Both of these factors, says Schulte, reduce soil temperatures.

Acid soils

Strongly acid soils absorb phosphorus from the soil solution and form insoluble phosphates that plants cannot utilize. Like cool soil, acid soil also slows micro-organism activity that breaks down organic phosphorus into forms that plants can re-use.

These are cases where additional phosphate can help young plant growth by providing a readily available source of phosphorus close to the developing roots, says Schulte.

In recent tests in Arlington, Wisc., lime and row-applied

phosphorus were used on acid soil. Corn grain yields were increased both by liming and applying row phosphorus, but the highest yield was obtained where row phosphorus and lime were applied, illustrating the connection between soil acidity and phosphorus availability, notes Schulte.

"Soils with a high fixation capacity should also benefit from row-applied phosphate," he states. "Phosphate applied in a narrow band comes into contact with less soil and, therefore, is less likely to become 'fixed' in unavailable form."

Shallow-rooted plants

Shallow-rooted plants are also likely to respond to row phosphorus in high-test phosphorus fields, says Schulte.

"With short roots, the plant is not able to gather as much phosphorus from the soil," he explains, "so added phosphorus can help the plant get the nutrients it needs and aid yield production."

Schulte also points out that additional phosphorus can hasten plant maturity and reduce grain moisture at harvest time.

"Tests have shown that added phosphorus can result in up to five percent moisture reduction," he adds. "This can save the farmer a significant amount of money at drying time and also give him a more timely harvest."

Schulte concludes that it is important for farmers to know their soil and know how best to treat it for maximum yields and profit.

Penn State plans forestry sessions

UNIVERSITY PARK — Penn State's School of Forest Resources and the Cooperative Extension Service is sponsoring two sessions to assist forest landowners and managers.

The First "Forest Management and Water Quality" has been chosen as the topic for the 1984 Forestry Issues Conference scheduled for March 13 and 14 at the Keller Conference Center. Increased management and harvesting are accentuating the importance of implementing sound practices to protect water quality.

The program will be comprehensive, discussing the water resources base, water quality terminology and the laws that deal with nonpoint-pollution. Speakers will also provide information relating to road construction and design, cable logging, alternative forest access systems, the impact of silvicultural systems, effects of whole tree harvesting, movement and persistence of forest management chemical and forest recreational uses. Municipal watershed management, acid rain impacts, waste water and sludge applications in the forest and fisheries management will be covered under discussions of special use situations.

This Conference will be useful to forest managers or anyone who is interested in protecting water

quality. For more information, contact the Ag Conference Coordinator, J.O. Keller Conference Center, University Park, PA 16802 or Forest Resources Extension, 110 Ferguson Bldg., University Park, PA 16802 (814-863-0401)

The second session will be a five-day intensive short course in forest management for private woodland owners and will be held at the University Park Campus of Penn State on July 23-27. Instructors of the course will be Jim Grace and Jim Finley of the School of Forest Resources and the Cooperative Extension Service. Prerequisite for the course is an interest in managing forestland.

No prior training in forestry is required of participants and topics covered will include dendrology, forest measurements, basic silviculture and produce marketing. The course will be limited to 30 students. Further information may be obtained by contacting Forest Resources Extension. Registration materials will be available at University Park and Berks County Extension Office in the spring.



Even in high phosphate soils, row applied phosphate can help plant roots and shoots develop in soils that are cold due to early planting, cold spring temperatures or high residue/no till conditions.

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