Switchgrass lessens soil nitrate loss into waterways: Researcher

AMES — By planting switchgrass and using certain agronomic practices, farmers can significantly reduce the amount of nitrates that leach into the soil, according to Iowa State University research.

For the past three summers, Matt Helmers, associate professor of ag and biosystems engineering, and Antonio Mallarino, professor of agronomy, have been studying the amount of nitrates that pass through soil into tiling systems from different crops and fertilizer treatments.

The research is funded by the Iowa Department of Agriculture and ISU's Leopold Center for Sustainable Agriculture. They found certain practices can minimize the amount of nitrogen and nitrates that leach from the field into the drainage tiles.

"One of the biggest things we found is that when alternative biomass sources like switchgrass are grown, even when they use fertilizer, we see dramatically lower nitrate concentrations (in the drainage water)," Helmers says in a news release.

The research compared fields that were planted in:

- continuous corn while harvesting just the grain;
- continuous corn taking the grain and stover; and
- continuous corn taking all possible biomass from the fields.

Half of those fields were treated with fertilizer and the other half with manure.

Other fields tested systems that rotate corn and soybeans, and others looked at switchgrass plots that received N. .

The results showed fields planted in continuous corn and treated with fertilizer had the most amount of nitrates leach below the crop root zone into the tile. The fields with the least amount of nitrates that leached through the soil were planted in switchgrass and treated with fertilizer or manure.

While switchgrass allows less nitrogen to leach into the soil, Helmers says farmers need reason plant it.

"Right now, there is not necessarily an economic market for (switchgrass)," he said.

"What we're trying to do is evaluate what might be the environmental benefits of that type of land use," he said. "I think that may be able to inform future policy.

"If we pursue a strategy for additional biofuels from various biomass feedstocks, we need to know what the environmental impacts of those different feedstocks are because that may play into federal policy," Helmers noted.

"If there is enough societal benefit and water-quality benefit from growing switchgrass on these soils, there may be potential incentives for producers to grow (switchgrass)," he said.