

Ammonium sulfate proves an efficient nitrogen source in trials

For crop consultants like Carl Fannon of Monroe County, Ark., ammonium sulfate (21-0-0-24S) is the No. 1 choice for curing sulfur deficiencies in rice.

But a new study shows ammonium sulfate isn't just good for sulfur. It's also a more efficient nitrogen source.

In a three-year study conducted by University of Arkansas agronomists Rick Norman, Nathan Slaton and Chuck Wilson, ammonium sulfate consistently out-yielded urea when applied a week or more prior to flood.

"Last year, ammonium sulfate increased yields by up to 30 bushels per acre," Norman says. The yield increase is because ammonium sulfate is less susceptible to N (nitrogen) loss from ammonia volatilization.

"Urea will be lost as ammonia gas if you don't get the flood water on in time," Norman says. "Ammonium sulfate is much more stable. Our studies showed very little N loss with ammonium sulfate even when the permanent flood was delayed by two weeks."

Standard sulfur treatment

Although ammonium sulfate contains 21 units of nitrogen, most of Fannon's growers think of it as a sulfur fertilizer.

"Sulfur is a must here on our sandy

soils," says Fannon, who manages 15,000 acres of rice in Phillips and Monroe counties. He also recommends sulfur on heavier ground if it has been landformed or laser leveled.

On varieties like Wells and Cocodrie, Fannon recommends 100 pounds per acre of ammonium sulfate, usually at the two- or three-leaf stage. This supplies the crop with 24 pounds per acre of sulfate sulfur, which is immediately available to plant roots.

"Elemental sulfur isn't as good because it takes too long to convert into a form that the rice crop can absorb," Norman says.

Johnny Skinner, an agronomist with Helena Chemical, recommends 1 pound of sulfur for every 10 pounds of nitrogen.

If sulfur deficiencies develop after permanent flood, Norman says you can fly ammonium sulfate right into the water.

As a nitrogen source, ammonium sulfate often takes a back seat to urea. But Norman says that's changing as consultants and growers become more familiar with the nitrogen chemistry in ammonium sulfate.

Norman says it's simply "more stable than urea as an ammonium nitrogen fertilizer source for rice."

To minimize N loss from urea, apply it onto dry soil and flood up within three to five days after application. But in the real

world, Norman says it often takes growers seven days or more to establish a permanent flood.

"The longer it takes for permanent flood, the more N loss you'll get from ammonia volatilization with urea," Norman says. "In our study, yields were comparable when urea and ammonium sulfate were applied one day before permanent flood. But once we delayed permanent flood by seven days or more, we started to see significant yield differences."

More flexibility, less N loss

At the UA Pine Tree Branch Experiment Station in 2001, ammonium sulfate out-yielded urea by 9 to 20 bushels per acre when fields were flooded seven days after application.

When permanent flood was established 14 days after nitrogen application, ammonium sulfate out-yielded urea by 18 to 30 bushels per acre.

"With ammonium sulfate, you can be flexible with your permanent flood without paying a yield penalty like you would with urea," Norman says. "You're also minimizing the impact of N loss on the environment."

This article was prepared on behalf of Honeywell.