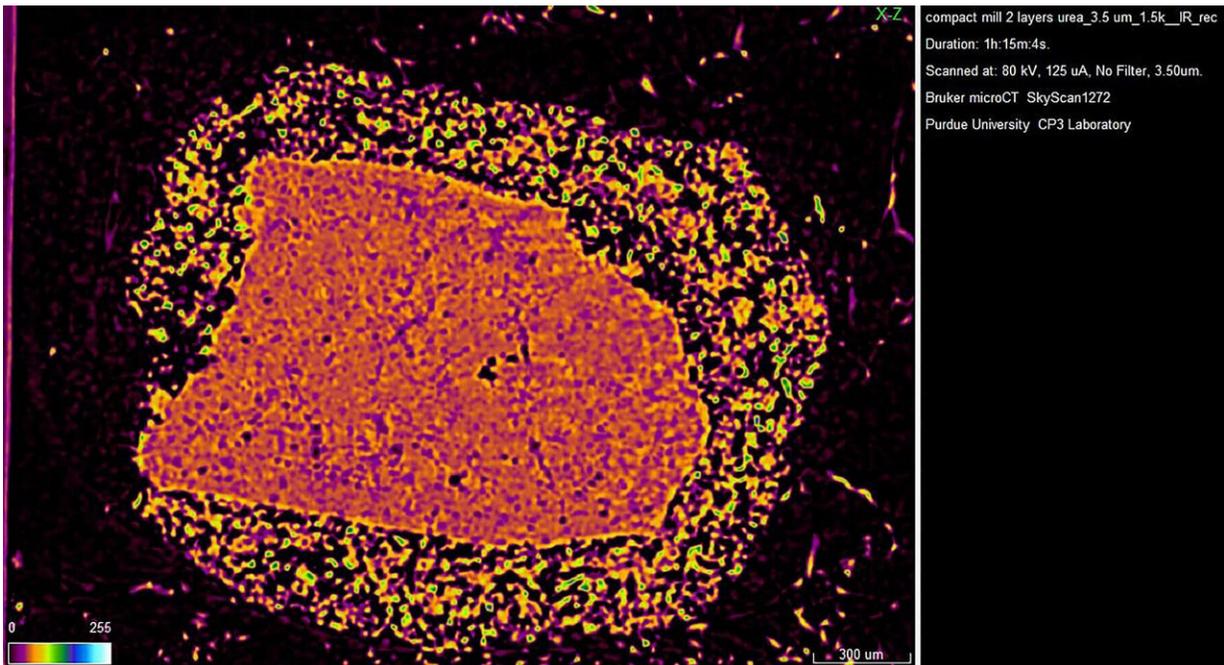


New nitrogen fertilizer texture may reduce nitrate levels, make water safer

May 16 2019, by Chris Adam



Purdue University researchers have developed a fertilizer involving a novel version of urea. Credit: Purdue University

Nitrate levels in water resources have increased in many areas of the world, largely because of applications of some types of fertilizers in agricultural areas. Since the mid-1920s, the deposits of nitrogen into land has more than doubled, leading to higher levels of nitrate in water resources.

Purdue University researchers have developed a [fertilizer](#) to try to combat this problem. The solution involves a novel version of urea, an inexpensive form of nitrogen fertilizer, which is widely used to increase crop yield.

"I believe we can help the [farming community](#) and reduce [environmental pollution](#) through our technology," said Kingsly Ambrose, an associate professor of agricultural and [biological engineering](#), who leads the research team. "We developed a layer-wise agglomerated controlled-release granular urea, which consists of two layers and has a slower dissolution rate than the urea granules available on the market."

Other members of the research team include Carl Wassgren, a professor of mechanical engineering, and Dhananjay Pai, a laboratory manager in mechanical engineering.

Ambrose said one big challenge with using urea is that its relatively low nutrient use efficiency does not hold up well against large amounts of flowing water or rain. The water can wash away most of the urea, leading to economic losses and severe pollution.

"The urea granule we developed has a slower dissolution pattern with the nutrients being released slowly at the beginning," Ambrose said. "Once the outer layer is fully saturated, the nutrients from the second layer are released. This slower dissolution reduces nutrient loss due to water impacts."

Ambrose said another advantage of the Purdue fertilizer is that its structural makeup will improve the nitrogen use efficiency to help lower fertilizer costs. He said the fertilizer Purdue researchers have developed could be used with existing granulation systems in the fertilizer industry and put in place with a simple installation procedure.

Provided by Purdue University

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