

# RESEARCH & RESULTS

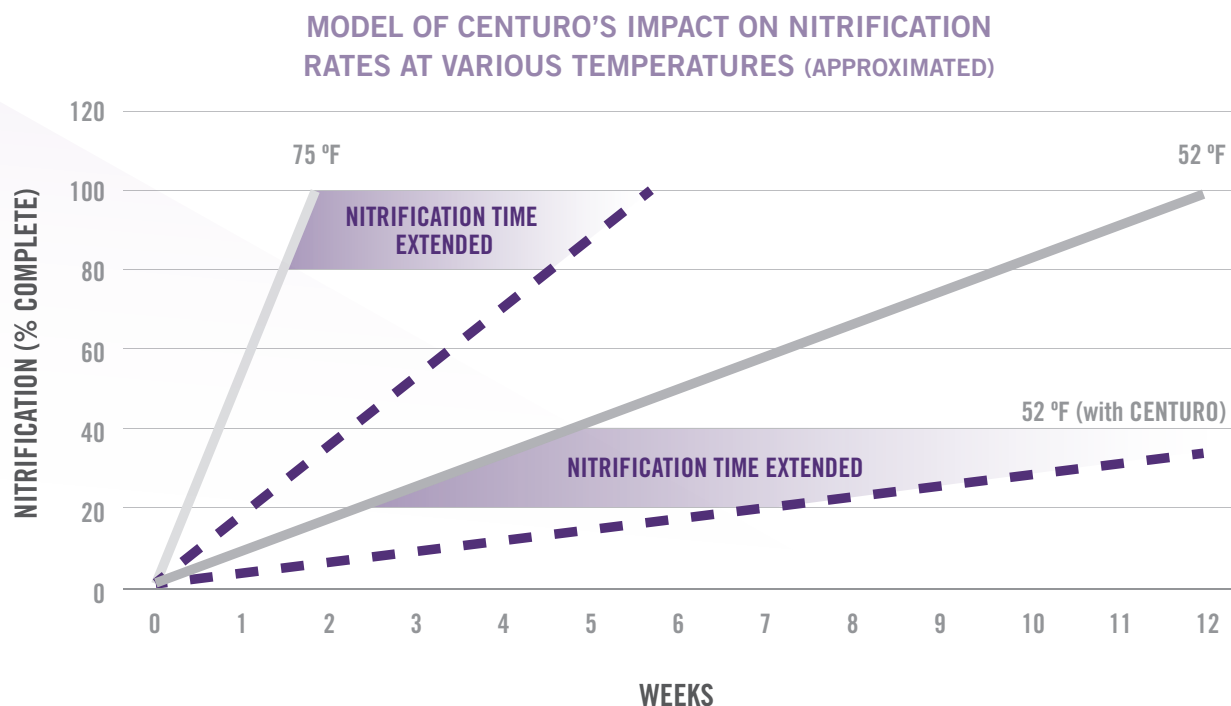


For the past nine years, a team of agronomists, chemists and technology specialists from Koch Agronomic Services have been working to develop a solution for growers' unique anhydrous ammonia stabilizer needs. CENTURO® nitrogen stabilizer is here to give growers an easy-to-handle, effective nitrification inhibitor solution.

## EXTENDED PROTECTION

Nitrification occurs when applied nitrogen is converted from ammonium to nitrate. In the nitrate form your investment is susceptible to leaching and can move beyond the plant's root zone. As a nitrification inhibitor, **CENTURO slows the conversion of ammonium to nitrate and can hold the nitrogen in the ammonium form three times longer than without an inhibitor.**<sup>1</sup>

Put simply, CENTURO extends your window of protection against the impact of environmental factors like temperature and moisture on the rate of nitrification. As shown in the model below, at 52 degrees Fahrenheit, 100 percent of nitrogen applied without an inhibitor would be nitrified in 12 weeks. However, with CENTURO, more than 60 percent of the applied nitrogen would remain in the ammonium form after 12 weeks. In spring applications, 100 percent of nitrogen applied without an inhibitor can be nitrified in two weeks at 75 degrees Fahrenheit. With CENTURO, less than 40 percent of the applied nitrogen would be nitrified.



Graph is derived from the Nutrient Management for Agronomic Crops in Nebraska (Tim Shaver, p.7) and third-party laboratory studies funded by Koch Agronomic Services.

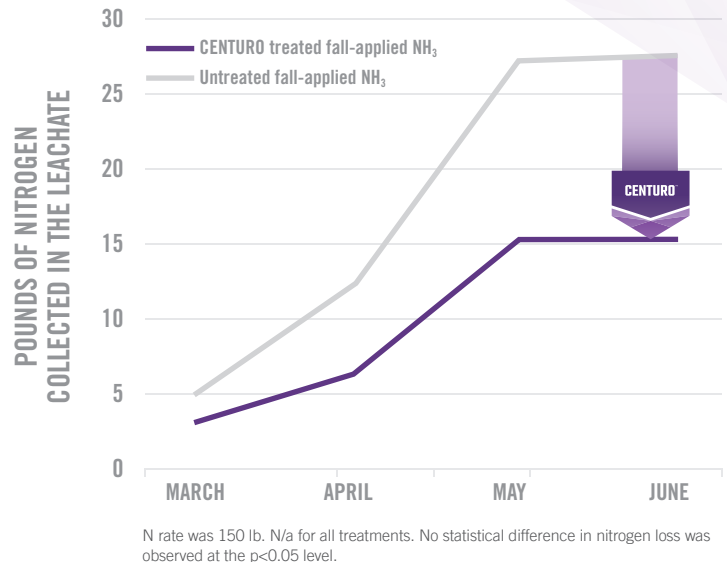
## REDUCES NITRATE LEACHING

If your nitrogen investment leaches beyond the crop root zone, you can lose out on valuable nutrients and yield potential. CENTURO was developed to combat nitrogen loss so more of your fertilizer is available when your crops need it. In the first two years of an ongoing tile drainage field study at Iowa State University, fall-applied and spring-applied ammonia treated with CENTURO nitrogen stabilizer showed a trend for decreased nitrate leaching.<sup>2</sup>

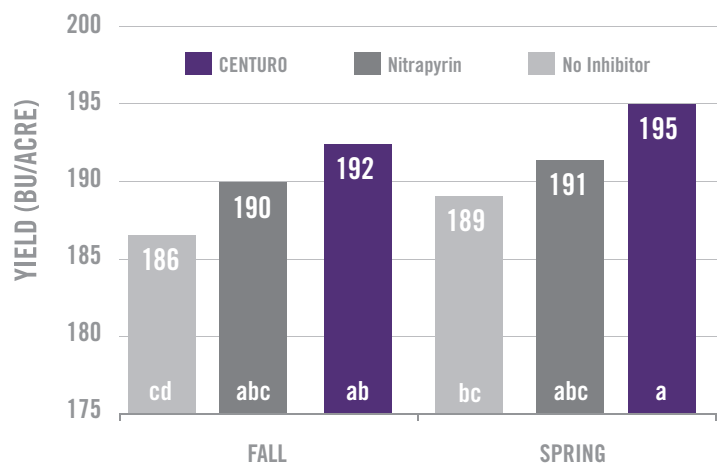
## IMPROVED EFFICIENCY & OPTIMIZED YIELDS

When you protect the nitrogen you apply, you maximize the nutrients available for crop uptake. Researchers often measure the effectiveness of nitrogen stabilizers by evaluating the crop's nitrogen use efficiency which is how much nitrogen is required to produce one bushel of grain. In 12 replicated trials conducted across twelve site locations in Nebraska, Illinois and Missouri in 2016, 2017 and 2018, CENTURO improved nitrogen use efficiency by up to 25 percent.<sup>3</sup> During the same trials, fall and spring-applied ammonia treated with CENTURO increased corn yield by an average of 6 bushels per acre compared to untreated fall and spring-applied ammonia.<sup>3</sup>

### CUMULATIVE AVERAGE LOSS IN FALL APPLICATIONS 2016–2018 IOWA STATE UNIVERSITY LEACHING TRIALS<sup>2</sup>



### CENTURO IMPROVED YIELD IN CORN AVERAGE OF 12 REPLICATED TRIALS<sup>3</sup>



N rate for all bars is 70% recommended rate

Bars with the same letter are not significantly different (p < 0.10)

## THE NEXT GENERATION OF NITROGEN STABILIZATION.

Protect your investment. Optimize your yield.

Contact your Ceres rep today about incorporating CENTURO into your plans.



CENTURO is not registered for sale or use in all states. Contact your state pesticide regulatory agency to determine if a product is registered for sale or use in your state. <sup>1</sup>The underlying data is based on third-party laboratory studies funded by Koch Agronomic Services; results may vary based on a number of factors, including environmental conditions. The underlying data was provided by <sup>2</sup>Iowa State University, <sup>3</sup>University of Nebraska, University of Missouri, and the Illinois Fertilizer and Chemical Association under Research Trial Financial Support Agreements with Koch Agronomic Services, LLC. Neither the universities or institutions, nor the individual researchers referenced, endorse or recommend any product or service. Improvements in nutrient use efficiency, yield and nitrate leaching may not be observed in all cases. CENTURO and the CENTURO logo are trademarks of Koch Agronomic Services, LLC. Koch and the Koch logo are trademarks of Koch Industries, Inc. © 2020 Koch Agronomic Services, LLC.