

AN INREC OVERVIEW:

Nitrogen Use + Application



Since 2015, the Iowa Nutrient Research & Education Council (INREC) has led monitoring efforts to enhance nitrogen management in agriculture. Through collaboration with agronomy retailers and Iowa State University, INREC reports on the progress towards improvements in efficiency and reducing nutrient losses. Key initiatives include a shift to spring and in-season nitrogen applications, increased cover crop adoption, reduced nitrogen rates, and expanded nitrification inhibitor use. These strategies help optimize nitrogen use, improve water quality, and enhance soil health across the state.

NITROGEN APPLICATION PRACTICES

TIMING: The most common time for nitrogen application in Iowa is during spring pre-plant, averaging 43.8% of total applications over a seven-year period. Efforts have been made to shift nitrogen applications from fall to spring or in-season to reduce nitrogen losses.

METHODS: The use of nitrification inhibitors, especially with fall-applied anhydrous ammonia, has increased. This method helps in reducing nitrogen loads by approximately 9% compared to applications without inhibitors.

NITROGEN RATES

INREC surveys indicate that commercial nitrogen fertilizer application rates varied due to a variety of factors such as weather and fertilizer pricing. The last three completed surveys show average commercial nitrogen rates have decreased since a peak in 2020.

Commercial Only Nitrogen Rates (lbs/ac)	2017	2018	2019	2020	2021	2022	2023	Average
Average Commercial N Rate on Corn in Rotation	170.0	172.3	177.5	183.4	170.9	173.4	166.6	173.4
Average Commercial N Rate on Continuous Corn	200.4	201.9	200.4	208.9	199.9	192.6	185.7	198.6



CONSERVATION PRACTICES

The adoption of cover crops has surged, with acres increasing from 1.6 million in 2017 to 3.8 million in 2023, averaging 320,559 new acres of cover crops each year. Cover crops, primarily cereal rye (81.9%), help in reducing nitrogen and phosphorus losses.

YEAR	ACRES (Millions)
2017	1.6
2018	2.0
2019	2.2
2020	3.1
2021	2.8
2022	3.8
2023	3.8

Cover Crop Adoption

Increased adoption of cover crops helps not only to reduce nitrogen loss by about 30%, but also reduces phosphorus loss by about 30% and improves soil health and water quality.

IMPACT + OUTREACH

The Council has been instrumental in driving awareness and engagement among ag retailers, farmers, and landowners. Numerous outreach events and educational programs have been conducted to promote best practices in nutrient management and conservation.

A key part of Iowa NREC is collaboration with organizations, agencies, and farmers within Iowa—but also outside of our state. Outside of Iowa and interested in replicating the Iowa NREC survey? Reach out! We welcome the chance to assist other states in an effort to improve water quality.

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Looking for more information?
Check out the process in more detail on our website.