

The Future of Controlled-Release Nitrogen Fertilizers

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Controlled- and slow-release nitrogen (N) fertilizers have been commonly used in high-value applications, such as horticultural production and turf. The benefits and enhanced N-use efficiency in these uses have been widely documented. Traditional controlled-release products have not been economical for wide-spread use in major agricultural crops because of high cost and low crop prices. New economical, controlled-release fertilizers are available for use in field crops such as corn (*Zea Mays* L.), wheat (*Triticum aestivum* L.), potato (*Solanum tuberosum* L.) and other commodity grains. New technologies have reduced manufacturing costs, while high N prices and interest in improved N-use efficiency and greater environmental stewardship have increased demand for new products.

University research shows that controlled N release improves crop output per unit of applied N, reduces N losses to the environment, and gives a grower greater control over the fate of applied N. Studies have shown crop productivity can be maintained with about 70-80% of the N typically needed from traditional N fertilizers. Research has also shown greater crop recovery of applied N and reduced losses by leaching, nitrous oxide emission, and ammonia volatilization with the use of controlled-release fertilizers.

Grower acceptance of new fertilizer products continues to increase as availability increases and economics become more favorable. With increasing farm size, the possibility of better N stewardship with fewer applications and wider time window for safe N application made possible with controlled-release fertilizers is perhaps the most significant driver of grower adoption. With demonstration of the enhanced efficiency of these N-management technologies, government agencies have recognized them as useful N conservation tools in conservation programs. We expected continued growth in the use of controlled-release fertilizers in agricultural field crops.