

Fluid Fertilizers Improve Fertilizer Use Efficiency

Product shines in drip irrigation, banded starter, and in-season research studies

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Introduction:

As the world's population continues to grow, the demand for efficient food production grows as well. In developing areas of the world, the local agriculture system is already overburdened and people are unable to get sufficient food with adequate nutritional value. Food scarcity can contribute to a host of societal problems, from mass migration in search of an improved standard of living to the rising popularity of radical political leaders.

Challenge:

Fluid fertilizers have long played an important role in food production, and contribute between 50% and 60% of yield. As global agriculture continues to require increases in production and efficiency, developing effective fertilization practices is a key component of feeding the world.

During the last 60 years, global demand for nitrogen, phosphorus, and potassium (NPK) has increased from 30 Mt/year to more than 180 Mt/year. Most of the increase comes from developing regions, including Asia, Africa, and Latin America.

Research:

Agronomists are comparing various options for crop nutrition, including type and source of nutrients, effective application rates and methods, and plant needs. Several studies have been undertaken to determine the efficiency of liquid fertilizer, including the three described below.

Methodology:

Staggenborg, Kansas State University: Researchers developed a fluid fertilizer delivery system using a buried drip system that delivered low-salt NPK fluid to corn. Grower standard practice (GSP) was an in-furrow starter of 30-30-0 with no follow-up fertilizer.

J.R. Simplot Company: The team compared various dry fertilizer formulations (broadcast and incorporated) with fluid starter (10 gallons/acre banded to the side and above the seed) on corn yield and quality. The fluid fertilizer used was low-salt NPK 6-24-6 with AVAIL®.

J.R. Simplot Company: An established alfalfa field was treated with three different concentrations of fluid 3-18-18 in between the first and second cuttings, then again between the second and third cuttings. University Extension procedural recommendations for measuring treatment response were followed.

Results:

Staggenborg found that applying a fluid starter band, along with in-season fluid injections of phosphorus, gave significant increases in yield over GSP.

Simplot's researchers found that the fluid starters improved corn yield by more than 20 bushels/acre over GSP, even in fields where initial soil test P levels were high.

The study on alfalfa fields found that crop quality and yield increased with multiple applications of in-season fluid fertilizers.

Practical Applications:

In-season applications of low-salt fluid fertilizers improved yield and economic returns. The highest yields came from applications of 5 gallons/acre of 3-18-18, while the most cost effective results came from applications of 2.5 gallons/acre of 3-18-18.