

Enhanced Efficiency Nutrient Management Studies in California on Peppers and Tomatoes Using FUSN™ and GAL-Xe® Controlled-Release Fertilizers

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Introduction:

Warm-weather vegetable crops, such as tomatoes and peppers, require precise nutrient management to maximize yields during their short growing season. New fertilizer products, such as FUSN™ and GAL-Xe®, seek to increase efficiency of nutrient delivery, and may be useful to California growers.

Challenge:

With the most common soluble fertilizers performing at approximately 50% efficiency, vegetable-producing areas of coastal California face growing legislative pressure to improve fertilizer efficiency.

Research:

Researcher David Holden established field trials on tomato and pepper fields near Oxnard, California, to compare the results of several nitrogen sources (urea, FUSN, and GAL-Xe) at several different treatment levels. This field trial aims to build upon several previous studies about nutrient timing and placement, to determine if the type of nitrogen source used could increase nutrient efficiency.

Methodology:

The peppers and tomatoes were transplanted from a greenhouse. The field was divided into six treatment plots. The first plot received the grower standard practice (GSP) of 180 lbs/acre N as urea applied before planting and incorporated into the soil, then 130 lbs/acre at three weeks after planting as a sidedress. (GSP also included several later N applications through drip tape, which were duplicated on all plots and so will not be listed.) The second plot received 180 lbs/acre N as FUSN (26-0-0) applied pre-planting and incorporated, then 180 lbs/acre FUSN at three weeks post-planting as a sidedress. The third plot received one treatment of GAL-Xe (43-0-0) at 125 lbs/acre pre-planting and incorporated. The fourth plot received one treatment of 180 lbs/acre of GAL-Xe pre-planting and incorporated. The final two plots were treated with GAL-Xe (44-0-0), one at 125 lbs/acre and one at 180 lbs/acre.

Results:

Peppers

Fields were harvested in early September and marketable yield was determined based on industry parameters for Jumbo, Extra Large, Large, and Medium peppers. Plots treated with either FUSN or GAL-Xe had more peppers in the larger categories than plants treated with urea. FUSN and GAL-Xe plots also had significantly higher numeric yield counts and higher total tonnage than did GSP. GAL-Xe increased marketable yield over GSP even with a reduction in total N applied.

Tomatoes

Numeric yield for tomatoes was relatively flat for all treatments, but GAL-Xe at similar application rates as GSP produced the highest overall yield.

Practical Applications:

GAL-Xe resulted in potential increases in returns of more than \$1,400 per acre for marketable yields and more than \$515 for total tonnage. The short growing season for tomatoes may require a combination of soluble N and CRF for best results.

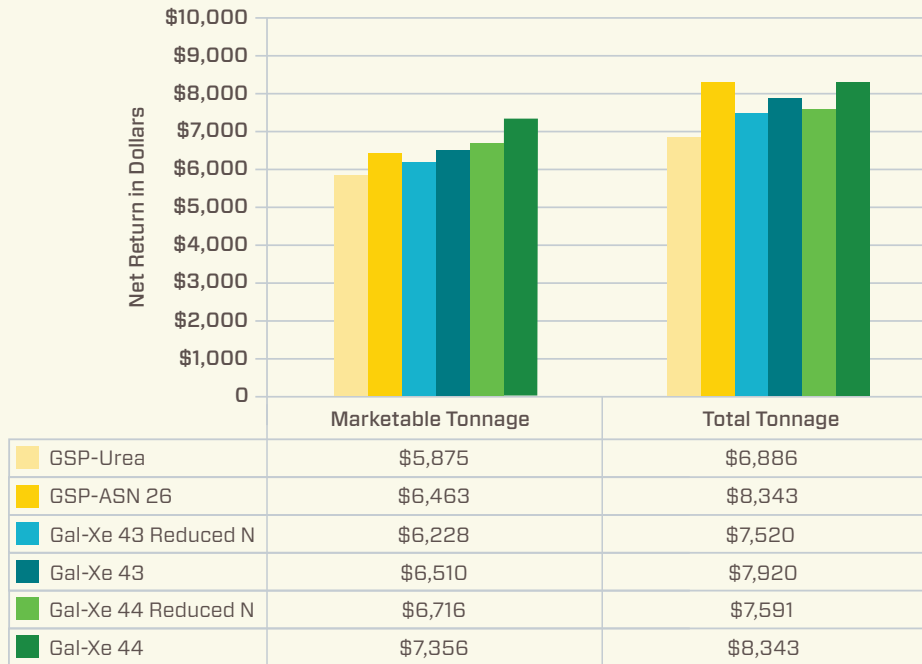


Figure 1. Economic parameters (prior to material costs being removed) for J.R. Simplot bell pepper field trials from Ventura, California—2014 growing season.

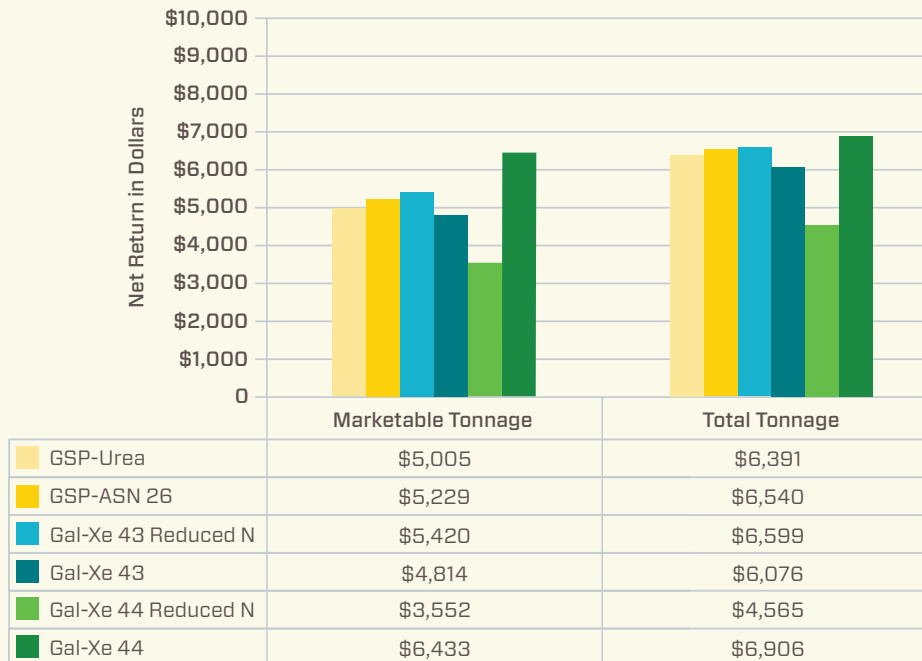


Figure 2. Predicted economic parameters for fresh market tomatoes being produced with J.R. Simplot advanced fertilizer technologies in Ventura County, California, during the 2014 growing season and being produced on drip irrigation.

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