FŪSN

Fused-Safe Nutrients™

Dry Nitrogen Fertilizer Sources Including FŪSN™ for Corn Production under Furrow and Sprinkler Irrigation with and without Starter 6-24-6

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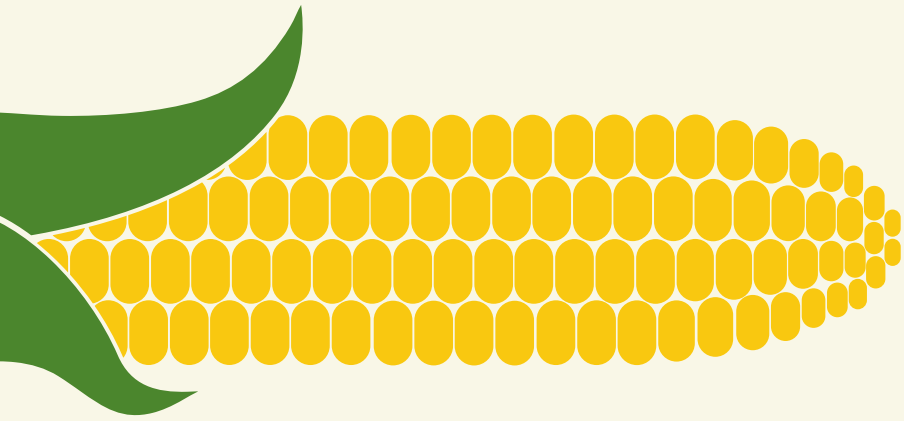
Southwest Idaho, 2015



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Field trials were initiated in cooperation with Simplot Land and Livestock and with support of West Canyon SGS on two separate fields, both in the Treasure Valley area of SW Idaho. The initial field was located in the Arena Valley area west of Wilder, Idaho, on a sandy, coarse-textured soil and under a pivot irrigation system. The field was planted to Pioneer 1150 Corn on 32-inch centers and at a population of 42,000 seeds/ac. Several dry nitrogen (N) fertilizer sources were applied with a Terra Gator equipped with GPS. Sources included: urea (GSP), NutriSphere-N® (SSN), PHT Eclipse, Yara's Amidus (40-0-0 with ammonium sulfate and elemental sulfur), BASF Limus (nitrification and volatilization inhibitor), Simplot's FŪSN (26-0-0-14), and urea/ammonium sulfate blend of the same analysis (26-0-0-14). Each fertilizer treatment was applied in a 120-foot-wide by 300-foot-long strip within the center pivot of Field 34-B. This configuration would allow each main plot to have 24 rows of corn and be planted using a 12-row planter. Each treatment was applied twice to increase the number of observations and to help reduce randomization errors within the field.

Starter formulations were also applied as a split plot within the main dry N treatments. This was done at planting. The planter was a Schlagle strip till equipped with a starter kit. Therefore, each seed row within the 12-row configuration would either have a starter or not. This allowed each of the dry fertilizers to be evaluated independently for yield responses associated with the liquid starter. A liquid NPK starter of 6-24-6 with AVAIL® was applied at a rate of 5 gallons/ac in furrow (directly on the seed). Fertilizer application took place on April 1, 2015.

Figure 1. Planting corn directly into standing heavy residue using a liquid, low-salt starter fertilizer of 6-24-6 with AVAIL—Arena Valley 2015.

Figure 2. Emergence of corn with starter 6-24-6 with AVAIL in heavy crop residue under minimum tillage—Arena Valley 2015.

An additional site location was initiated at Karcher Rd outside of Nampa, Idaho. The entire treatment design and layout including the use of low-salt starter fertilizers of 6-24-6 with AVAIL were used. However, differences with the locations were related to tillage and irrigation. The Karcher Rd location was under traditional tillage where plowing was used. Irrigation water was surface-applied under furrow irrigation. Both locations had N fertilizers applied to the soil surface with no incorporation to allow as much change in N losses to volatilization to occur as part of evaluating differences in the N inhibitors being evaluated.

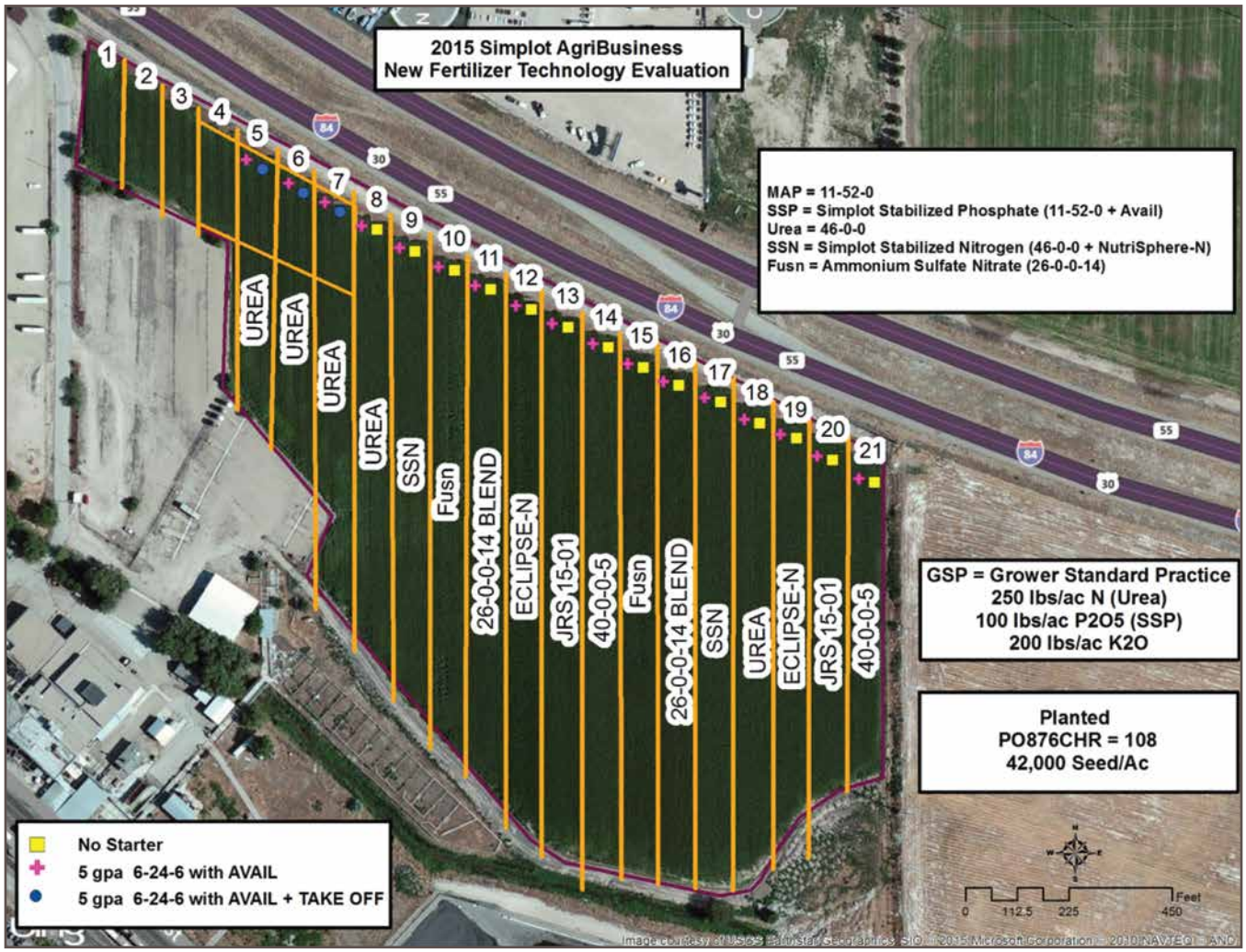


Figure 3. Treatment map for Karcher Road location in Nampa, Idaho, indicating dry N fertilizer treatments that also included 6-24-6 with AVAIL for each of the split treatment applications.

An important part of the design and implementation of these field trials was not only to report on the data and provide a summary, but also conduct field days and discuss within a field setting. There were six field day events held with as many as 60 people at one time attending. Other groups were smaller and included only two or three key crop advisors, growers, or administrators.

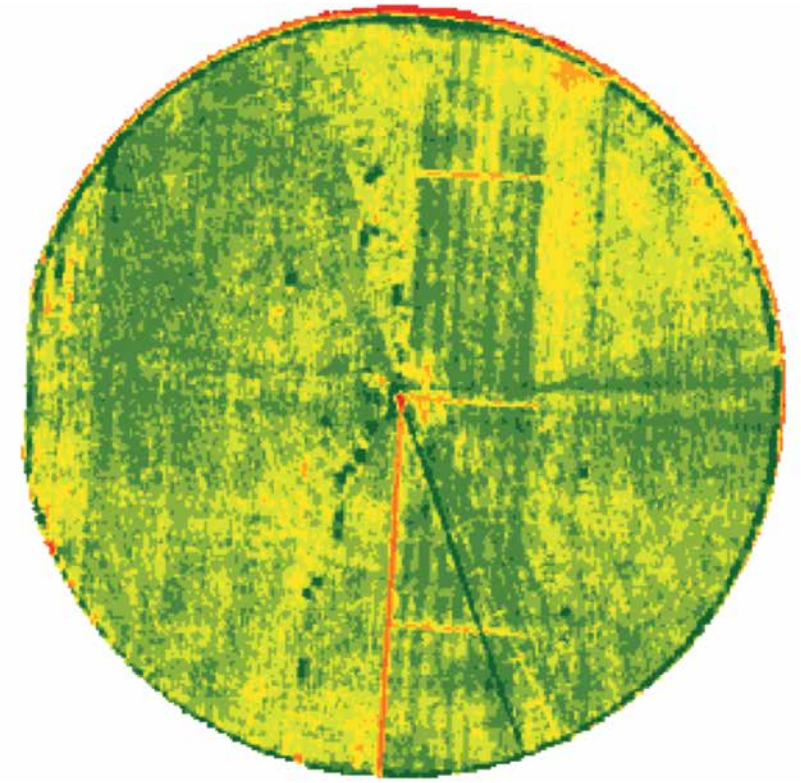


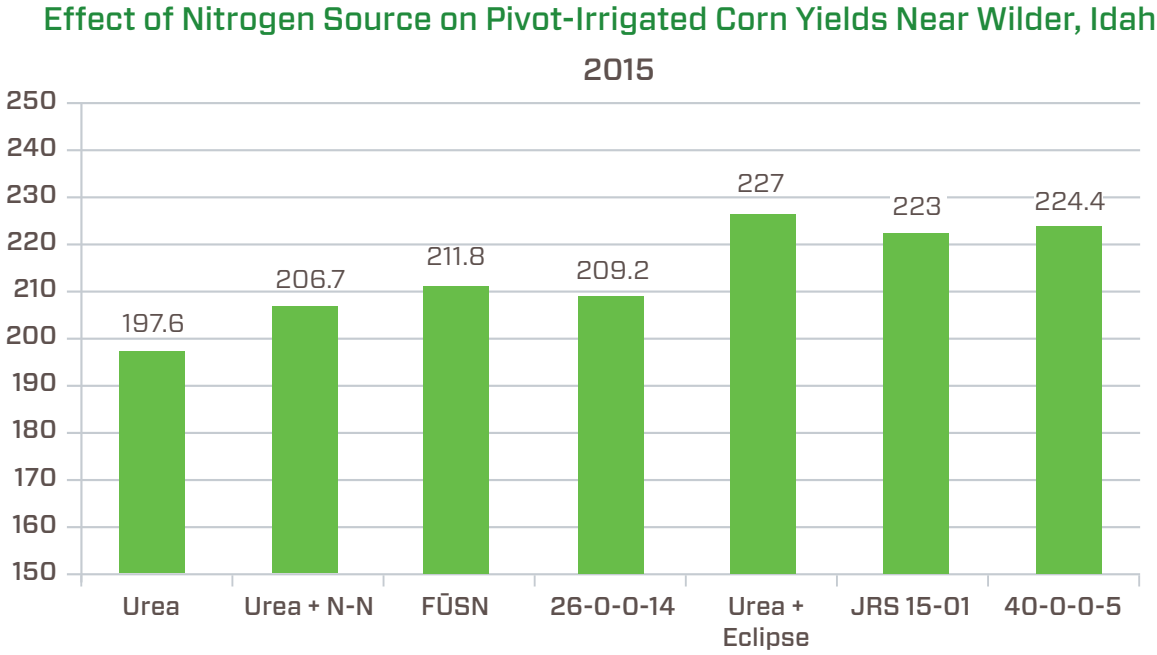
Figure 4. Arena Valley N study indicating the strips (greener) where 6-24-6 with AVAIL was applied in furrow on corn-2015.

Figure 5. Field days from 2015 that explains the functionality of using Simplot dry N fertilizer formulations as well as the benefits of 6-24-6 w/AVAIL starters.

Figure 6. SGS crop advisors discussing N fertilizer products with starters as well as 4R Nutrient Stewardship and the role of JRS in enhanced-efficiency fertilizers.

Results of the 2015 field trials were encouraging and allowed a better determination of N responses for both a single year as well as multiple years.

Yields for 2015 were mixed and lower than previous years. All N treatments provided greater yield advantages over the grower standard practice of using only urea as the primary source of N. FŪSN yield responses were higher than the GSP by 14 bu/ac for pivot irrigation compared to an improvement over GSP under furrow irrigation of 16 bu/ac. The design of the experiment allowed a greater amount of N loss in the Arena Valley, because of the longer period of time between N application and incorporation than Karcher Rd. Because of this, the NBPT product Eclipse—which purposely inhibits volatilization compared to urea used in the same method—provided the highest yields in the Arena Valley. However, under furrow irrigation, where the N was not exposed for as long a period of time, Eclipse had less of an impact on yield (Fig. 7).



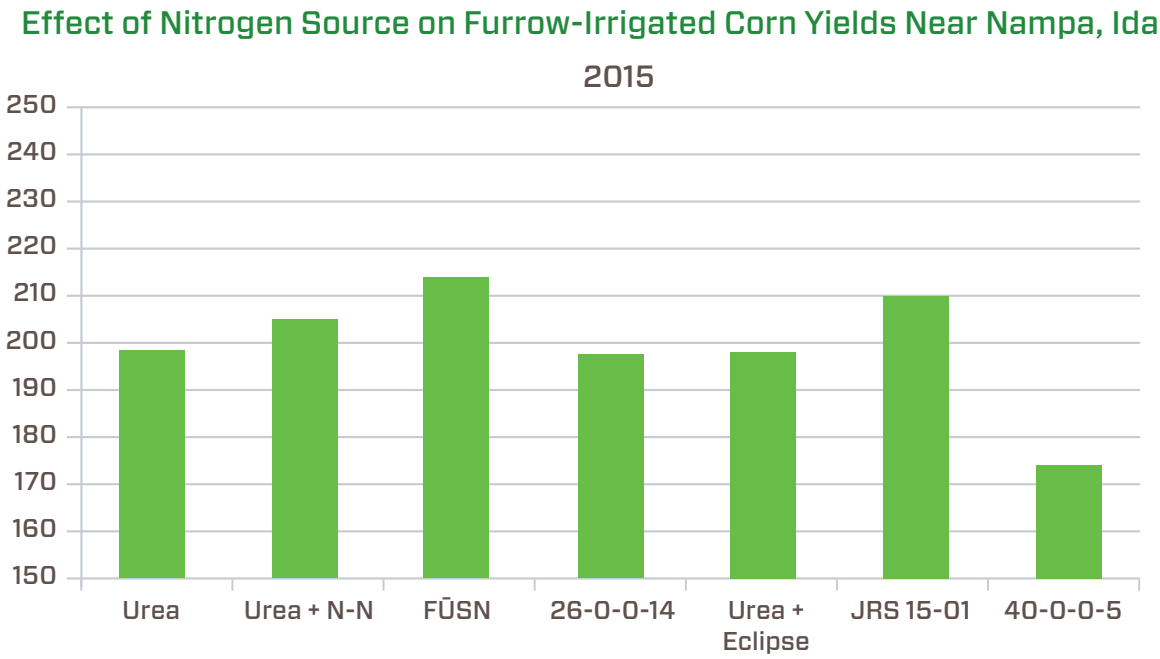


Figure 7. Yield comparisons between Arena Valley corn yields under pivot irrigation and Karcher Rd under furrow irrigation.

Starters benefited yields across all treatments and continue to be a positive contribution to growers who are incorporating them into their management strategies (Fig. 8). While the response in 2015 ranged from a 3–9 bu/ac increase, the value of early growth development and root structure was evident through all early stages of plant development. These early season changes can be directly related to improving yield potential under different management systems.

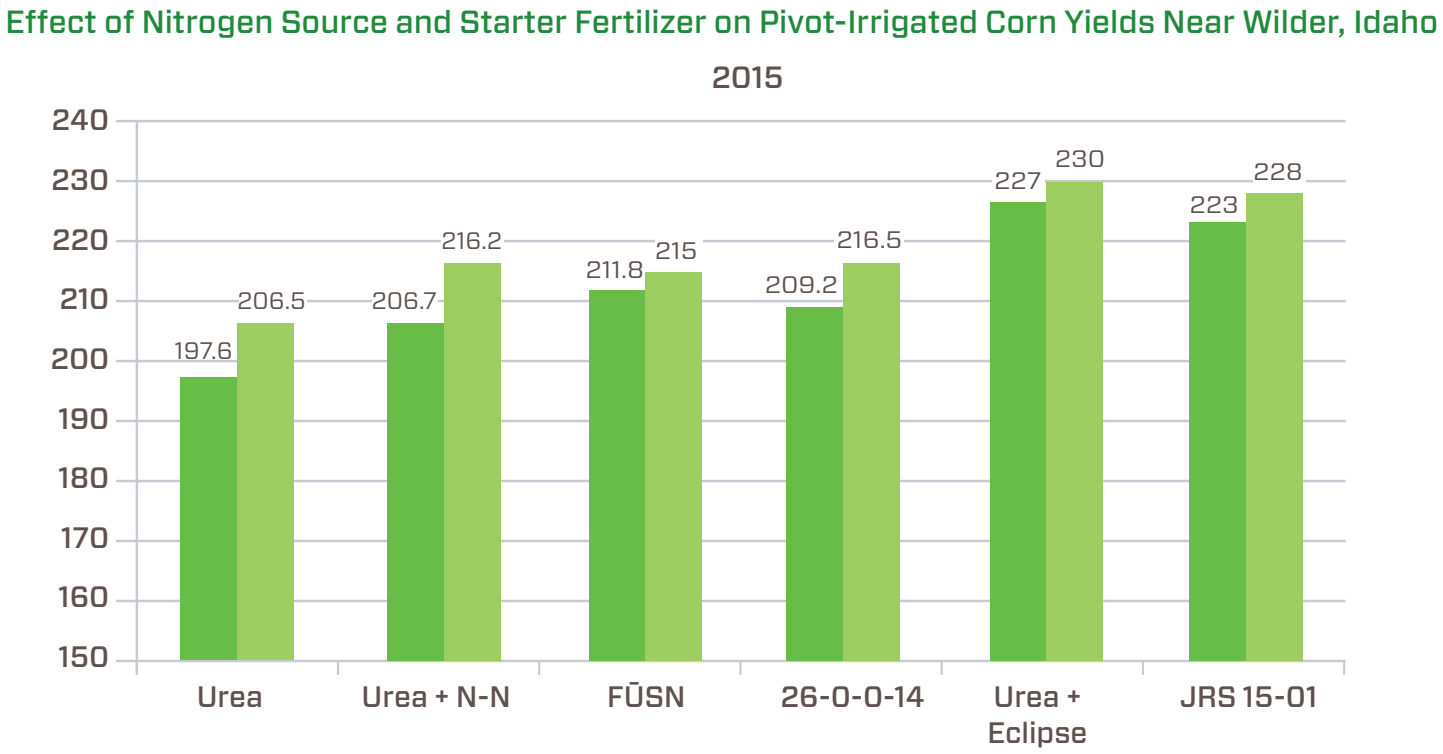


Figure 8. Response of starter 6-24-6 with AVAIL to various dry N formulations—Arena Valley, 2015.

A four-year yield summary indicates a very positive response to both NutriSphere-N (SSN) and FŪSN compared to urea (Fig. 9). These responses indicate that recently developed N fertilizer technologies have a place in production areas of the western U.S. under irrigated conditions. Crop advisors should continue to feel positive about making recommendations for these type of materials as they become available within their areas.

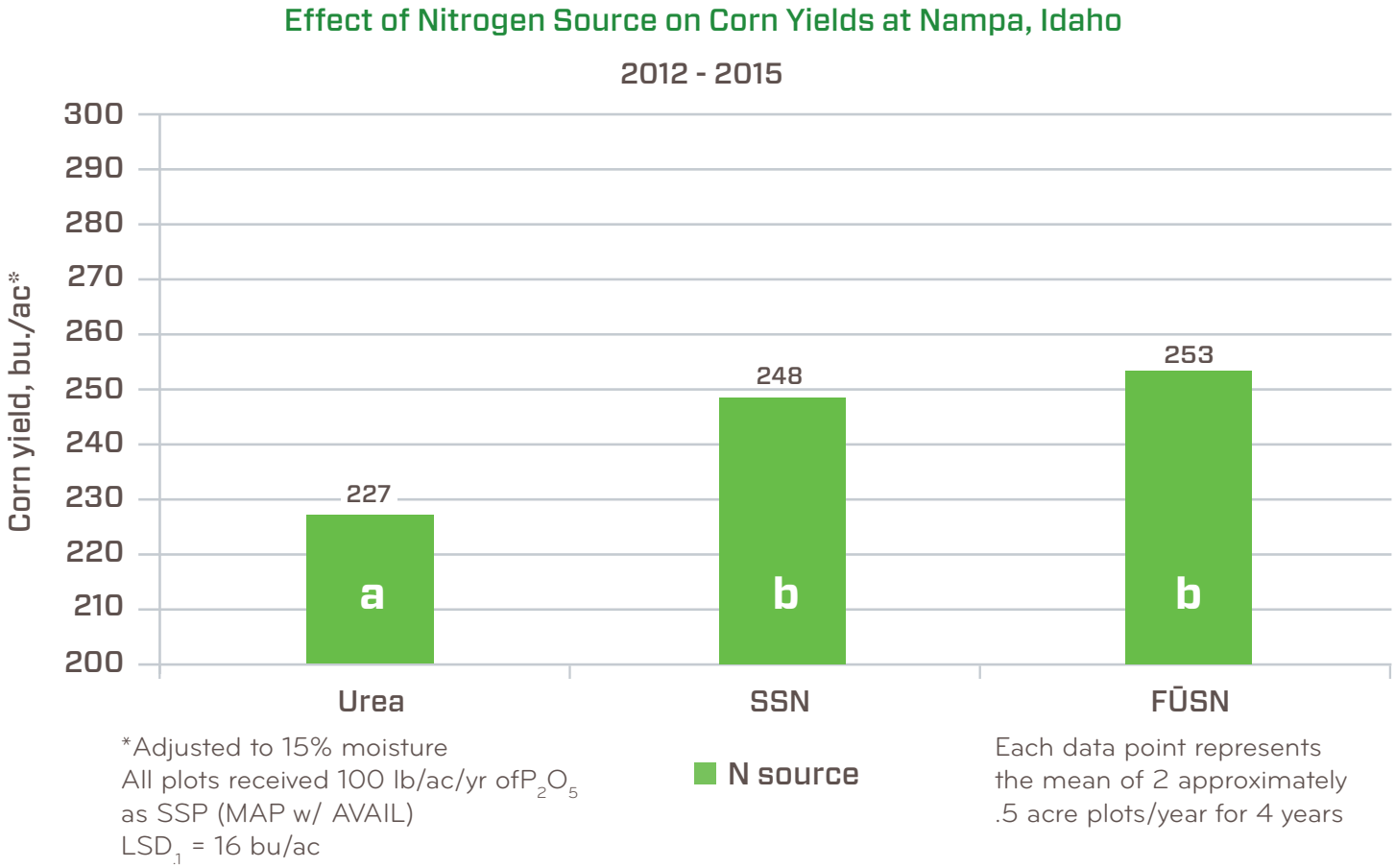


Figure 9. Yield responses at Karcher Rd comparing corn yields from 2012 to 2015 (four years) to NutriSphere-N (SSN) and FŪSN to surface-irrigated fields.

Simplot has a goal to address 4R Nutrient Stewardship by developing products and materials that can be used within various production practices. It is not always about the rate of a fertilizer practice, but may often be related to combining rates, timing, placement, and in this case the source of N fertilizer being applied. A company dealing with agribusiness is often addressing a community's needs when they can offer alternatives to what has been a standard practice for many years. Although the up-front investment is high, the resources spent in the short term allow our customers to better address economic responses and environmental impacts while at the same time addressing community needs within the areas we are conducting business.

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