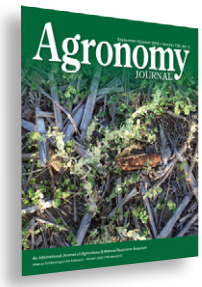

Phosphorus Uptake by Potato from Fertilizers Recovered from Anaerobic Digestion

Of the major plant nutrients, world resources of P are the smallest, and peak P is predicted to occur globally by 2030. Because of potential shortfalls in P availability, P should be used as efficiently as possible to conserve the resource base and maintain agricultural productivity. A variety of promising P-enriched products recovered from anaerobic digesters (AD) on U.S. confined animal feeding operations (CAFOs) are emerging as commercially viable. These include traditional products such as digested liquid manure and biosolids and newer products such as recovered P-enriched fine solids and struvite.

In the September–October 2016 issue of the *Agronomy Journal*, researchers report on a multi-year study conducted in the Columbia Basin of Washington to determine the availability and uptake efficiency of P recovered from AD dairy and poultry manures in potato production.

The team found that among the AD-recovered P materials and P rates applied, tuber yields were not significantly different from commercial mono-ammonium phosphate (MAP), with P recovery efficiencies averaging 42% at 56 kg P ha^{-1}.

All recovered AD-P materials evaluated provided adequate P to potatoes when equal rates of P were applied and the method of application was comparable, indicating AD-recovered P can be used effectively as a substitute for commercial P fertilizers.

Adapted from Collins, H.P., E. Kimura, C.S. Frear, and C.E. Kruger. 2016. Phosphorus uptake by potato from fertilizers recovered from anaerobic digestion. Agron. J. 108:2036–2049. View the full article online at http://dx.doi.org/doi:10.2134/agronj2015.0302

Increasing Nutritional Status and Yield of Corn by Optimizing Plant Spacing

In order to supply the food needed for the growing world population in the next decades without additional impact on natural resources, cropping systems must be redesigned. It is well known that uniform within-row plant spacing is a key crop management strategy to obtain high corn (*Zea Mays* L.) yields. However, at the field scale, uniform plant spacing is not frequently achieved. A new concept of precision planting is emerging based on the use of modern devices on planters that can overcome uneven plant space distribution across the field.

In the September–October issue of *Agronomy Journal*, researchers show that in order to achieve a high level of corn yields, a new high standard of uniform-row plant spacing is required. Optimizing the within-row plant spacing also results in higher crop sensor readings, suggesting an improvement in the efficiency of plant nutrition in well-fertilized soils. Based on the average of two site-years, the planter equipped with a vSet (Precision Planting, Tremont, IL) vacuum meter system improved the uniformity of plant spacing (CV = 22.5%) compared with a traditional planter with a mechanical horizontal plate metering system (CV = 38.7%). This optimization of within-row plant spacing increased the corn yields by 10.7% (Fig. 1). Although the modern devices for planters have decreased the error in plant distribution, no planter that has been investigated has attained the optimum plant spacing uniformity (CV < 10%) required to achieve the maximum corn yield, suggesting that additional planter improvement will be necessary.

Adapted from Hörbe, T.A.N., T.J.C. Amado, G.B. Reimche, R.A. Schwalbert, A.L. Santi, and C. Nienow. 2016. Optimization of within-row plant spacing increases nutritional status and corn yield: a comparative study. Agron. J. 108:1962–1971. View the full article online at http://dx.doi.org/doi:10.2134/agronj2016.03.0156

Example of an anaerobic digester on a CAFO. *Photo courtesy of USDA.*

A: Uniform plant spacing within the row in corn. B: Nonuniform plant spacing within the row.