Comparing Evapotranspiration of Corn, Soybean, and Prairie Grasses

Land use in the U.S. Upper Midwest has evolved from small grains and prairie systems to corn (Zea mays L.) and soybean [Glycine max (L.) Merr.]. This change has been suggested to cause a decrease in landscape evapotranspiration (ET) and consequently an increase in streamflow.

In an article recently published in Agronomy Journal, researchers estimated ET from corn, soybean, and native prairie grasses using the satellite image-based surface-energy balance model METRIC in west-central Minnesota. The land covers analyzed were irrigated and non-irrigated corn, non-irrigated soybean, native prairie grasses under different grazing and burn regimes, and wetlands.

Model estimates showed some seasonal variability in the ET values between different units; higher ET of native prairie grasses in early spring compared with higher ET in mid-summer for row crops. However, the growing season ET of corn and soybean was similar to that of unburned prairie but much higher than that of recently burned prairie. Considering soybean replaced both prairie and low-ET small grains suggests that changes in growing season landscape ET from the changeover of vegetative cover starting in the 1940s are likely minimal.

Adapted from Baeumler, N.W., J. Kjaersgaard, and S.C. Gupta. 2019. Evapotranspiration from corn, soybean, and prairie grasses using the METRIC model. Agron. J. 111. View the full article online at http://dx.doi.org/doi:10.2134/agronj2018.08.0506

Composted Cattle Manure Not Detrimental to Sugar Beet Production

During times of economic uncertainty and decline, all costs of agricultural production including fertilizers become important and require re-evaluation. In sugar beet production, most farmers do not have an option of manure as an alternative N source since N availability from manure can occur too late in the season and affect sugar quality. Composted cattle manure as different as it is from fresh manure might be a viable alternative N source for sugar beet production.

In a paper recently published in Agronomy Journal, researchers report on three-year studies from Nebraska Panhandle where different rates of composted cattle manure were compared against urea in sugar beet production.

The team found no adverse effect of composted cattle manure in beet production and composted cattle manure produced yields comparable to urea. It is important to account for residual nitrate-N in soil profile deeper than 120 cm when managing nitrogen in beet. The study underscores an opportunity and need to explore improved beet varieties, strive for better crop stand, and consideration for leguminous crops in rotation.

Composted cattle manure presents a viable alternative N source for sugar beet production especially during times when chemical fertilizers get cost-prohibitive and provided that purchase and transport cost of composted manure are minimal.


Chippewa Prairie site. Photo courtesy of S. Gupta.

University of Nebraska Panhandle Research and Extension Center team harvesting sugar beet.

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