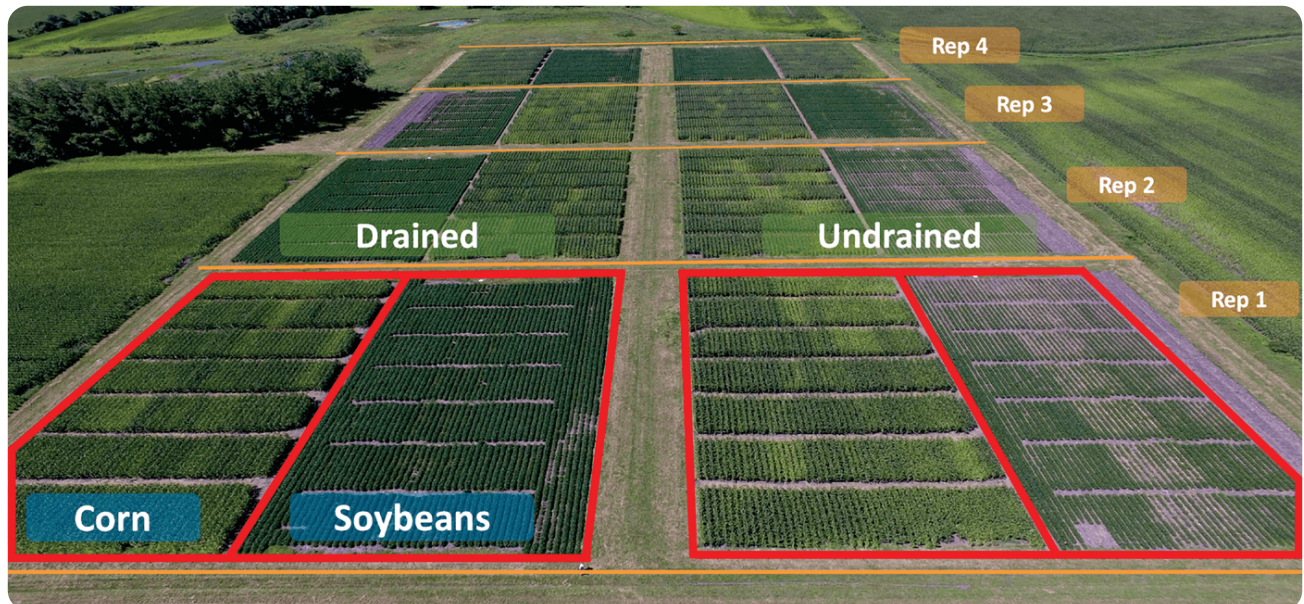




Nitrous Oxide Emissions From Soybean After Corn Nitrogen Management

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Aerial view of the study site near Wells, MN with drained and undrained blocks replicated four times containing corn and soybean crops and nitrogen treatments. Photo by Gabriel Paiao.

Nitrogen fertilization is important for crops, but it can lead to environmental degradation and nitrous oxide (N₂O) emissions, which can be exacerbated by poor soil drainage. Although soybean grain typically removes more nitrogen than corn, most N₂O emission studies are focused on corn because corn receives direct nitrogen fertilization. However, there are no studies looking at the residual effect of nitrogen fertilization to corn on the following year's soybean crop and N₂O emissions under different soil drainage conditions.

Researchers studied the soybean phase of a corn–soybean cropping system to measure grain yield and N₂O emissions from poorly drained soils with and without subsurface drainage tile. The previous corn crop received either no nitrogen or an optimum amount as a single or split application. Soil drainage had no impact on soybean yield; however, in wetter-than-normal growing seasons, subsurface drainage tile reduced nitrous oxide emissions. Nitrogen fertilization practices in the previous corn crop had no effect on soybean grain yield, nitrogen removal, or N₂O emissions, but emissions were more than two times greater in corn.

The team concluded that adequate drainage and including soybean in rotation with corn can provide N₂O mitigation benefits.

Adapted from

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