

Pest&Crop newsletter

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In This Issue

- [Nitrogen Management Guidelines For Corn In Indiana](#)
- [Delayed Harvest Considerations For Corn In Indiana](#)
- [Thoughts On Profitable Fertilizer Rates](#)
- [Pest&Crop 2021 Survey](#)
- [Grain Post-Harvest & Recertification Workshop](#)

Nitrogen Management Guidelines For Corn In Indiana

(Jim Camberato), (Bob Nielsen) & (Dan Quinn)

This report summarizes corn yield response to fertilizer nitrogen (N) rate in field-scale trials conducted around the state of Indiana since 2006. These results are applicable to N management programs that use efficient methods and timings of N fertilizer application.

The Agronomic Optimum N Rate (AONR) represents the total amount of fertilizer N (including starter N) required to maximize yield, but not necessarily profit. The AONR in these trials varied among regions of the state from about 211 to 254 lbs N / ac, depending partly on soil organic matter and soil drainage characteristics.

At five Purdue Ag. Centers where we conducted paired trials of corn following soybean (corn/soy) and corn following corn (corn/corn) from 2007 to 2010, the average AONR for corn/corn was 44 lbs greater than for corn/soy while average corn/corn yields were 18 bu / ac less than the corn/soy yields.

Economic Optimum N Rates (EONR) are defined as those that maximize dollar return from the nitrogen fertilizer investment. Because the yield benefits from additional N decrease as N rates approach the AONR, the EONR will almost always be less than the AONR. Region-specific EONR, calculated for various combinations of N fertilizer cost and grain price, are provided in the accompanying tables.

To read the full report, click [HERE](#).

Delayed Harvest Considerations For Corn In Indiana

(Dan Quinn)

According to the USDA/NASS crop progress and condition report

https://www.nass.usda.gov/Statistics_by_State/Indiana/Publications/Crop_Progress_&_Condition/index.php), for the week of October 25, Indiana corn harvest progress currently sits at 57% for the state which is 3% behind 2020 and 1% behind the 5-year average. This week marks the first time that corn harvest progress has dropped below the 5-year average for 2021. Furthermore, despite the overall lack of differences compared to average in the most recent report, recent persistent and heavy rainfall for much of the state likely allowed minimal corn harvest progress this week and will likely cause harvest progress to be delayed even further moving forward.

Delayed corn harvest further exposes the corn plant to unfavorable weather conditions and causes plant quality and stalk integrity to further decrease. Therefore, the longer corn remains in the field, the more susceptible it becomes to significant lodging caused by severe storms and/or wind damage. Delayed harvest also adds additional risk to corn fields that may already have poor stalk integrity due to previous drought conditions and foliar disease (e.g., tar spot) (Telenko and Quinn, 2021). Recent research has shown that corn yield losses can occur between 5 and 10% when late-season lodging occurs due to a delayed harvest (Turner et al., 2021). Furthermore, a corn plant with weak plant integrity is also more susceptible to suffering yield losses due to premature ear drop. Research in both Ohio and Kentucky determined that most corn yield losses from delayed harvest occur when delays are extended beyond mid-November (Thomison et al., 2011; Turner et al., 2021). Delaying corn harvest into late November or early December can result in significant yield losses due to ear and kernel losses at the combine head during harvest, and an increased total of damaged kernels.

Delayed corn harvest as a result of persistent rainfall can also cause grain moisture levels to increase or fail to decrease to a level suitable for minimal grain drying. This may cause farmers to harvest corn at higher moisture levels than intended, thus increasing grain drying costs. In addition, higher grain moisture levels may also negatively impact grain test weight levels. Although grain test weight is not related to high corn yields, it is important when selling grain to local grain buyers. Grain test weight and moisture are inversely related. Therefore, the higher the grain moisture, the lower the test weight at that specific time, yet as the grain dries in either the field or the dryer, test weight will increase if kernel integrity remains (Nielsen, 2021).

Frequent rainfall causing a delay in corn harvest can also cause reductions in grain quality and increase the potential for vomitoxin contamination caused by ear diseases such as Gibberella ear rot (Paul et al., 2021). Frequent rainfall, hybrid susceptibility, and corn ears remaining in an upright position can cause the right conditions for fungal infection, specifically at the base of the ear. Therefore, it may be important to start checking some of the corn remaining in your fields for the presence of ear rots.

The USDA currently still predicts a state record corn yield average for Indiana in 2021, therefore there is likely still plenty of high yield corn out in fields that needs to be harvested in order to avoid yield losses. However, it is still important to remember that harvesting corn on less-than-ideal soil conditions can cause significant compaction, which can cause serious issues in future planted crops. Therefore, in certain situations it may be worthwhile to allow the ground to freeze before harvesting to avoid significant soil compaction issues.

Overall, here's to hoping that the fall rainfall can finally shut off to allow farmers across the state of Indiana to finish off the rest of this 2021 corn crop and avoid the potential issues that occur when harvest is delayed.



Picture 1. Fall 2021 corn field trial harvest at the Purdue Agronomy Center for Research and Education, West Lafayette, IN.

Thoughts On Profitable Fertilizer Rates

(Jim Camberato) & (Alex Helms)

Fertilizer rate decisions have more potential impact on profits when soil test levels of a nutrient are deficient, because yield can be decreased by nutrient deficiency to an extent that offsets the savings of reduced fertilizer rates. This approach to fertilization is often called the "Sufficiency Approach", where the rate applied is targeted to produce the highest return to fertilization in that season without regard to the impact on future seasons. This has not been the philosophy recommended by Purdue for at least the last 40 years. The approach we have recommended is the "Build-up and Maintenance" approach (or "Build-up, Maintenance, and Draw-down" approach in the original Tri-State recommendations. This approach was used because it minimized the potential for yield loss due to nutrient deficiency and gave farmers the flexibility to skip a fertilization when fertilizer prices were high, commodity prices were low, fertilizer was unavailable, field conditions were unsuitable for application, etc. This conservative approach to fertilization was well-suited to farmers who owned the land they farmed or had stable leases on the land they rented because the additional P and K they had added over several years remained in the soil and could be taken advantage of in later years if maintenance rates of fertilizer could not be applied. Unfortunately, this is not the most profitable approach in times of high fertilizer prices (if expected to fall in future years) or when farmers are cash renting on a yearly basis.

We began to conduct experiments to gather the data necessary to make "Sufficiency" recommendations for K in 2019 at the Southeast

Purdue Ag Center and in 2020 at the Northeast and Davis Purdue Ag Centers. These experiments continue but have not been harvested in 2021. At this point we have four sites years of data for soybeans and one for corn. This is not enough data to make recommendations, but the early results support what most researchers suspect - the amount of fertilizer needed at deficient soil test levels to maximize dollar return to fertilizer is less than the "Build-up recommendation". We illustrated this with the soybean data from 2020 - the SEPAC data from 2019 told the same story. Read the full store [here](#).



Severely potassium deficient soybeans at the SEPAC location in 2020 required K rates above crop removal but less than the build-up recommendation.

Fertilizer Price Adjustments to Fertilizer Recommendations

Pest&Crop 2021 Survey

(John Obermeyer)

Dear Pest&Crop Readers:

Though this is one of the strangest, most challenging years, the Pest&Crop authors haven't stopped providing updated information. The following is a link to a simple, short online survey. Please consider doing this right now, as we need your evaluation of this newsletter. Too, we need to show our funding agencies whether or not this information from Purdue specialists throughout the season is meaningful to you and the industry. Thanks in advance for your support!

https://purdue.ca1.qualtrics.com/jfe/form/SV_40I3qMFO23Xp1oW

Grain Post-Harvest & Recertification Workshop

(Lexie Wilson)

Thursday, December 9, 2021 - Beck Agricultural Center, West Lafayette

The Grain Post-Harvest & Recertification Workshop, hosted by the Purdue DTC is geared toward farmers, commercial grain storage handlers, pest management professionals and food processing quality-control managers.

The workshop goal is to help attendees effectively manage postharvest grain storage and handling systems to reduce pests, choose appropriate pest-control strategies, adopt integrated pest management systems and prevent grain from going out of condition in storage.

Workshop check-in begins at 8:30 a.m., and programming runs from 9 a.m. to 4:45 p.m. at the Beck Agricultural Center at Purdue's Agronomy Center for Research and Education, 4550 US-52, West Lafayette, IN 47906.

The workshop also will serve as this year's last opportunity for Indiana's certified advisers to earn continuing certification hours (CCHs). Offered

CCHs for this course: 7A (7 CCHs), 7D (7 CCHs), RT (4 CCHs).

Space is limited, so reserve your seat using our online registration tool today.

[Online Registration](#)

[2021 Grain Post-Harvest Flyer](#)

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