

# Agronomy Notes

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Capital Region Extension Agronomy Team



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## Adjusting Soybean Seeding Rates To Maximize Profit

*Written by Jim Beuerlein and Edwin Lentz from the Ohio C.O.R.N newsletter*

The cost per unit of soybean seed has been increasing steadily for ten years and will continue to do so as new traits are added to varieties. Because seed cost is a major production expense, it is important to use no more than necessary to produce the most profitable crop. The most profitable soybean seeding rate is determined by many factors including variety characteristics, soil productivity factors, cultural practices, weather during the growing season and finally, the interaction of the components of those major factors. In the final analysis, the plant population at harvest is the important factor, and is typically 60-80 percent of the seeding rate. Percent germination and emergence, loss to disease, and die-off due to plant competition determine the harvest population.

The most profitable plant population is a function of plant size, and the smaller the plants, the greater the number needed to maximize yield. For example, we need 30,000 corn plants, or 150,000 soybean plants or 1,500,000 wheat plants per acre for good yields. Therefore, the bigger the plant the fewer we need, and that rule also works for plant size within the soybean crop. A rule-of-thumb is: best yields are produced with about 100,000 plants 40 inches tall, or about 130,000 plants 30 inches tall, or about 170,000 plants that are 20 inches tall. The typical seeding rates needed to produce those populations are 125,000, 175,000 and 235,000 respectively.

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Following are some factors that allow a reduction in seeding rate or require an increase in seeding rate for soybeans grown in 7.5-inch rows and starting with a seeding rate of 200,000 seeds per acre:

### Reduce the seeding rate by (see below) if:

- 75,000 ---- Plants are normally 40 "tall at harvest
- 25,000 ---- Plants are normally 30" tall at harvest
- 20,000 ---- The soil has more than 2.5 % organic matter
- 20,000 ---- The seed has a fungicide treatment
- 20,000 ---- Tillage was used to prepare a seed bed
- 20,000 ---- Planting full season variety early
- 20,000 ---- The soil drainage is excessive (inadequate water)
- 15,000 ---- The soil drainage is very good (get more growth)
- 15,000 ---- Soil has a high water supplying capacity

If multiple factors apply, use the one allowing the *lowest* seeding rate.

### Increase the seeding rate by (see below) if:

- 50,000 ---- Planting the last half of June
- 35,000 ---- Plants normally are only 20" tall at harvest
- 25,000 ---- Planting the first half of June
- 25,000 ---- The soil has less than 2.0 % organic matter
- 25,000 ---- The soil has low fertility level
- 25,000 ---- Planting an early maturity variety
- 20,000 ---- The soil drainage is very poor
- 20,000 ---- Fields prone to soil crusting

If multiple factors apply, use the one allowing the *highest* seeding rate.

**John Rowehl, CCA**  
**Grains - Cumberland Co.**

BETTER CROPS AND PROFITABILITY

PENNSTATE



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### Ready, Set, Mow!!!

This growing season sure has started off in a tizzy. Glancing out the window as I write this article on April 16<sup>th</sup>, I see snow blowing around after we just received almost 1.5 inches of rain. Many areas south of here have gotten more.

Regardless, manure still needs hauled, wheat needs top-dressed and the rye is coming on fast. Although corn planting hasn't started yet, oats and alfalfa seeding is way behind. By the time you receive this newsletter, the first cutting of forages will be right around the corner. Will you be ready?

All predictions for planting intentions this year are for a dramatic increase in corn acreage. Some estimates are showing intentions to be nearly a 15% increase, with visions of \$4.25 corn dancing in everyone's head. Many smaller producers are intending to plow up sod and plant corn so total forage production for 2007 may be significantly less as a result. These factors all point to an unusual and stressful situation facing forage producers this year.

Forage producers know the first cutting of alfalfa and grass each year produces the largest yield. Some estimates show the first cutting can be 40% of total yields. Because of this, the first cutting has the potential to provide forage feeders with an entire feeding season of either outstanding quality or poor quality forages. Are you ready for forage harvest?

**The first cutting sets the stage for all preceding forage harvests.** A delay will significantly reduce forage quality and may prevent maximum forage yields for the season. Avoid any delay in harvesting first cutting! It's been said before but is always worth repeating.

**When the time is right –  
stop planting corn and make hay!!**

Don't get caught behind on first cutting, especially if weather conditions in early to mid-May are suitable. Pre-bud or pre-boot harvest of many stands may make the difference between excellent forage and disaster. Weather in the next week or so may turn wet and keep you out of the fields for 10 days or more. If you take an early harvest be sure to let 3<sup>rd</sup> or 4<sup>th</sup> cutting reach early bloom, maintain soil fertility levels (K<sub>2</sub>O) and stay ahead of potato leafhoppers this summer to ensure a healthy stand.

A heavy first cutting will slow harvest speed. Because of the importance of getting forage harvested on time and quickly, haylage or baleage should be the harvest method of choice.

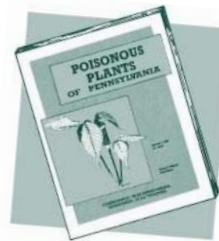
To ensure good quality haylage and baleage, optimum moisture levels are crucial. **Grass crops** should be 40 to 60%. Because alfalfa is high in calcium, which buffers haylage fermentation, moisture levels for **alfalfa haylage** should be slightly less at 40 to 55% moisture. If making baleage, be sure to wrap bales with at least 6, preferably 8 mils of plastic to ensure an airtight seal. Wrapping should take place within 24 hours, preferably sooner.

Limit bale diameter to 4 feet to minimize handling extremely heavy bales and ensure safety. For protection, store bales on the ends, which have significantly more layers of plastic wrap. Mark and store by cuttings. Baleage made at optimum moisture and wrapped properly has the potential for 12 months or longer storage. Bales made under less optimum conditions will not have the storability and may need to be fed out in 3 to 6 months.

**Paul H. Craig, CCA  
Forages – Dauphin Co.**

### Poisonous Plants Reference

The front page article of the April Agronomy Notes included helpful information from Paul Craig regarding poisonous plants in pastures. In response to that, we would like to provide you with additional information regarding a publication available for purchase.



“Poisonous Plants of PA” includes information on plant names and family associations, plant characteristics and poisonous plants parts. It also covers symptoms of poisoning, mode-of-action and treatment categories for aiding poison victims. Line drawings are also presented, which demonstrate plant parts required for identification.

This valuable publication can be ordered from the PA Department of Agriculture for \$8.00 by calling 717-787-5109. You may also visit the website at <http://www.agriculture.state.pa.us/agriculture/cwp/view.asp?a=3&q=128397>

### H. Grant Troop, CCA Joins Penn State Extension

Grant will be working as a regional No-till Coordinator across the Capital Region. He will be available to work individually with farmers on all aspects of no-till production, as well as coordinate regional no-till educational programs such as “Park-the-Plow”, a no-till transition program. Please join us in welcoming Grant to the Capital Region Extension team.

## **Corn Nitrogen Management PSNT, Chlorophyll Meter, Residual, Broadcast and Sidedress Nitrogen**

With the high cost of fertilizers, particularly Nitrogen (N), growers will want to credit all sources of N on the farm. Sources include previous legume crops, recent manure applications and an often unmentioned source - the supply of nitrogen from the soil organic matter. A well managed, healthy soil with annual applications of manure has the ability to supply significant quantities of N to a growing corn crop. In fact, the largest "pool" of N in the soil is contained in soil organic matter (OM). This N is released in the nitrate form of nitrogen, through the natural process called mineralization. Mineralization is essentially the consumption of OM by microbes. The process begins as soils warm in April and continues to increase with temperatures throughout the growing season.

This natural process, coupled with frequent applications of manures, can easily supply 100, 150 or more lbs/a. of available nitrogen. Soil management practices that help to conserve and build soil organic matter, such as no-till and conservation tillage, will benefit the most from mineralization. Studies show what growers are finding out - even in no-till situations, the use of cover crops and timely applications of manure will supply a significant portion of the crops N needs.

How do you know if enough nitrogen will be available for a particular field? One tool to guide you in your planning is a "**Nutrient Balance Worksheet.**" This is a simple form which helps you to account for the amount of N, P and K that goes on (as fertilizers, manures, etc) and comes off (as grain & forage) of each field. Copies are available from your local Extension office. To complete a balance sheet you will need:

- A recent soil test with fertilizer recommendations
- A reliable estimate of the amount of manure applied to each field
- A manure analysis (estimates are available in the Penn State Agronomy Guide)
- An estimate of the percent (%) of manure N available to the crop based on your handling practices (date of application and incorporation). These are also available in your Agronomy Guide (p. 38, table: 1.2-14, 2007 edition).

If the extra N needed for the crop is within 50-75 lbs. and you have built up the soil with consistent manure applications, you may be in a position to "wait and see" if it is actually needed. The PSNT (a soil nitrogen test) and Leaf Chlorophyll Meter both can be used when corn is approximately 8-12" to determine if you need any additional N. These tests are specifically

designed for fields with high fertility (manure, other organics or after alfalfa). The only limiting factor is that they are the most reliable if you **do not apply broadcast N before planting** - applying starter is okay. Later, you can test to determine if additional N is needed. It would then be applied as a side dress treatment, the most efficient use of expensive nitrogen.

If your balance sheet calls for over 75 lbs. of N, these tools are less useful. In this situation you may want to put some N down as a broadcast or through the planter. Some tips to remember:

- Use of a urease inhibitor, if broadcasting urea, will reduce volatilization until rain incorporation
- Other forms of N, such as ammonium sulfate will not volatilize.
- If banding starter 2 X 2, do not exceed 70 lbs. of nitrogen plus potash
- If additional N is desired, consider a pop-up on the seed and then applying a N solution or dry product 3 or more inches off of the row. Liquids can also be dribbled between the row.

The efficiency of nitrogen fertilizers follows this order: **sidedress, at planting and preplant broadcast.** Dribbling the balance of your N as UAN on the surface or injecting anhydrous when corn is 8-12" should be considered when practical. In many cases, a little starter followed by sidedressing can be a very efficient method of applying all your commercial N needs.

Penn State data has shown that similar amounts of N applied as a sidedress vs. broadcast consistently result in more N being available to and utilized by the corn crop. Another benefit of waiting to apply N is that you can determine if it is actually needed. This is **very helpful in no-till situations** where manures and residues are left on the top. These tools will show if the N from recent manure applications and the mineralization of cover crops and past manure use will allow you to reduce or eliminate that expensive N.

Many county Extension and Conservation District offices now have chlorophyll meters or will assist you in taking a soil nitrate (PSNT) test. Check with your local office. In some cases, you can sign out a meter and receive training in its use. In many offices, staff is available to aid in using the meter. Meters are available on a first come basis, so call several weeks ahead to get your name on the list to ensure that a meter will be available when you need it.



**Jeffrey Graybill, CCA**  
**Agronomy - Lancaster Co.**  
**May 2007**

**Crop Insurance Update**

The crop insurance policy provides protection for a lot of different damage or loss situations. For example, replanting and prevented planting protection is provided for corn, soybeans and numerous other crops. So, if you experience these types of problems, be sure to contact your crop insurance agent before you destroy evidence that is necessary to support your loss claim.

Always remember to promptly notify your crop insurance agent and ask what you are required to do if you:

- Added additional land to your operation on which you will be growing insured crops in 2007.
- Have failed newly seeded acreage and need to re-plant (you may be eligible for a replant payment)
- Are prevented from planting an insured crop by final planting date (you may be eligible for a prevented planting payment). If faced with prevented planting, double check the rules before you take actions.
- Suffer winterkill damage on winter wheat or barley.
- Suffer other crop damage.

**DO NOT destroy the evidence of damaged crops or prevented planting** until authorized in writing by a loss adjuster.



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