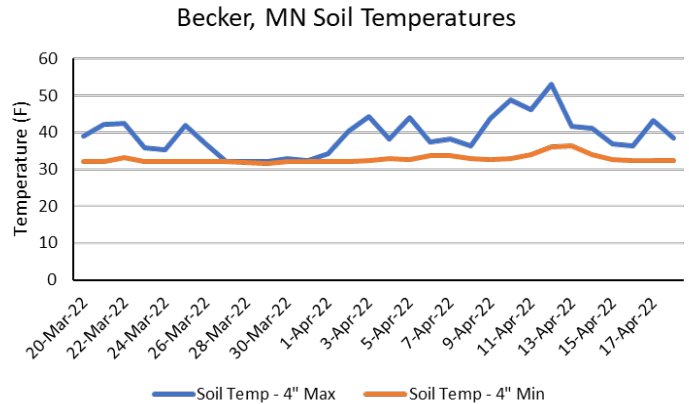




Nick Schimek
Pioneer Field Agronomist

Field Update – Soil Temperatures and Alfalfa Planting

I think we are all ready for the cold and snow to be over so we can get the 2022 growing season underway. A piece of weather information we pay close attention to every spring are soil temperatures. We want to ensure the seed is going into warm soil...or at least warm enough to prevent cold injury. The NDAWN and UMN track the 4" soil temperature at several weather stations through the heart of central MN including: Wadena, Staples, Little Falls, Rice, and Becker. The average bare soil temperature are all tracking ~33-35°F as of Monday (4/18). Daily fluctuations have topped out at 53°F on light-textured soils near Becker on April 12th. We have a little ways to go in order for temperatures to stay above the 45-50°F target, but as air temperatures climb then we will see soil temperatures follow closely behind.

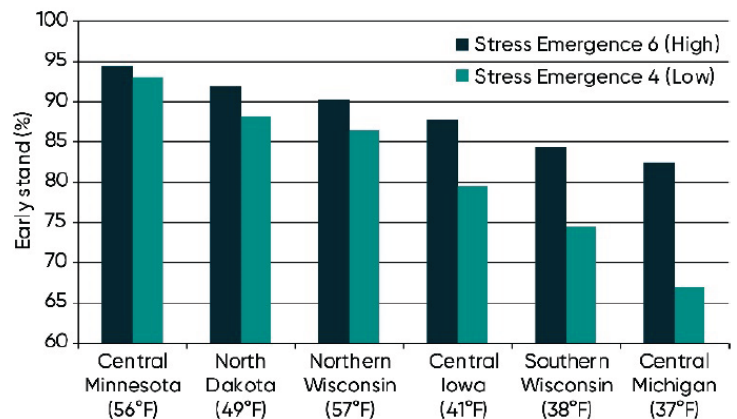


Alfalfa plants have broken dormancy and I observed new shoots starting to form while walking fields last week. It is too early to make any decisions on old stands yet, however, we have entered the ideal seeding window to get new stands established. Alfalfa can grow at a min. temperature of 37°F, which allows for spring planting as soon as conditions are fit. Remember, in order to successfully establish a healthy alfalfa stand, then target a planting rate of 15-18 lbs at ¼ - ½ inch deep into a firm seedbed with adequate fertility. The newsletter this week includes further considerations for planting corn and soybean this spring.

Ready for Planting? Early Considerations

The weather may be cold to start the week, but conditions will change and planting will be in full swing shortly. Since the cool conditions are lingering, there are a few items to consider when heading to the field this spring:

- 1) **Temperature-** A minimum of 50°F at the 2-inch depth should be targeted for corn and soybean since no growth occurs below this temp., even though water can still be absorbed. Soil temperature is affected by air temperature interaction with soil type, soil moisture, and residue cover.
- 2) **Soil Fitness-** "Fitness" is related to whether the soil moisture is correct at planting depth to prevent compaction. Planting into unfit soils (too wet) can result in compaction issues that last the entire season. Ensure proper fitness by taking a handful of soil at the 3-4 in. depth and form into a ball. If the soil easily crumbles then the ground is fit to work.



Average stand establishment for high and low stress emergence score hybrids at six stress emergence locations. Temp. indicates the 7-day soil temperature.

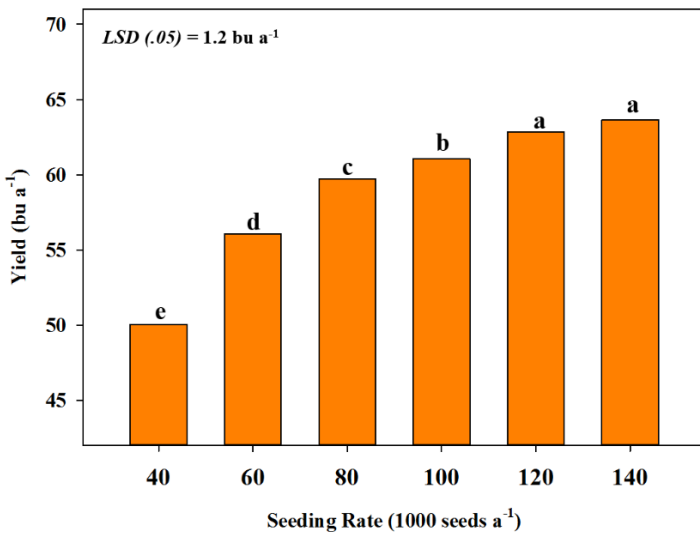
Additional factors to consider to manage early planting include: robust seed treatment, average last frost date, adjustments in planting depth when needed, and hybrid tolerance to stress emergence. A hybrid with a higher degree of stress tolerance can help reduce genetic vulnerability to stand loss due to cold soil temperatures.

Soybean Seeding Rates- Part 1

Soybean seeding rates have decreased by ~2000 seeds/acre/year and now average ~142k seeds/acre. The main reason for the steady decline since the turn of the century can be contributed to: changes in seeding equipment, seed treatment adoption, improved seed quality and vigor, and adoption of herbicide traits. Soybean yields are not necessarily driven by plant population, but rather fruiting sites per unit area. Therefore, a common question that follows is: how low can I go? Below are several factors that should be considered when deciding upon a seeding rate:

- **Seeding Equipment-** Row crop planters improve seed placement both lineraly and vertically compared to air seeders or grain drills, allowing for reduced pops.
- **Soil Type/Conditions-** Increased seeding rates may be needed in cold/wet soils or soils prone to crusting.
- **Planting Date-** Early planting allows for more nodes to develop, while populations should be increased as planting is delayed to compensate for less nodal development.
- **Disease Mangement-** Lowering populations can reduce an environment favorable for white mold. Also, utilize a seed treatment to allow for more successful establishment.
- **Weed Control-** Lowering populations can slow canopy closure and increase reliance on your herbicide program. Utilize a strong PRE, followed by a POST with an additional residual to improve weed control.

Overall, the ideal seeding rate is a balance of trying to maximize yields at a sufficient population and will vary depending on your specific situation/management practices. A number of research trials have suggested stands of 100k at harvest are sufficient to maximize yield. Remember, this is the final stand *AT HARVEST* and based on excellent to ideal planting conditions. Univ. of MN suggests an average harvest stand of 125-150k per acre in central MN to maximize yield due to shorter statured soybeans and fewer total nodes.



Maturity group	Seeding rate
Group II soybeans	140,000 live seeds per acre
Group I soybeans	150,000 live seeds per acre
Group 0 soybeans	160,000 live seeds per acre
Group 00 soybeans	170,000 live seeds per acre

Left: Seeding rate impact on soybean yield in WI studies. Conley, S. and Smith, D. University of Wisconsin.

Above: University of MN soybean seeding rate recommendations by maturity group. Steve Naeve, UMN Extension Agronomist.

Nick Schimek's Contact Information

Phone: (507) 525-6297 Email: nicholas.schimek@pioneer.com

Twitter: @NickSchimek and @Pioneer