Evaluation of Spring Wheat Seeding Rates

WHEAT WISE

Plotting the Future

Protocol

Ideal seeding rates can vary significantly, and are dependant on many factors including management, variety, and environment. Research has demonstrated that seeding rate can have an impact on grain yield and quality. The goal of this protocol is to fine tune generalized seeding rate recommendations, under your environment and typical management practices, to maximize yield and economic return.

Objective: Analyze the agronomic and economic impact of seeding rate in spring wheat.

Treatments:

Treatment 1: 20 plants/ft^2

Treatment 2: 25 plants/ft^2

Treatment 3: 30 plants/ft^2

The producer will calculate their seeding rate based on thousand kernel weight (TKW) and seed quality to achieve desired plant population. They will then seed a low, average, and high seeding rate based on the desired plant population All treatments must be managed the same throughout the growing season. Seeding depth, seed treatment, fertility package, and chemical usage must be kept the same across all treatments. Variable rate fertility may be used, as long the trial area is done in a representative area of the field. Each rate will be replicated 4 times. The width of the strip must be as wide, or wider, than the combine header that will be used. The length of each harvested strip should be no less than 1000 feet.

Rep 1	Treatment 1
	Treatment 2
	Treatment 3
Rep 2	Treatment 2
	Treatment 1
	Treatment 3
Rep 3	Treatment 1
	Treatment 2
	Treatment 3
Rep 4	Treatment 3
	Treatment 1
	Treatment 2

Field Selection:

When choosing a field, ensure there is a large enough representative area for the trial to fit. The length of the harvested treatments should be no shorter than 1000 ft. Trials will be replicated and randomized; Randomized Complete Block Design (RCBD) will be used to design the trial, which means there are 4 replications each with the total number of treatments in a different order. RCBD helps to account for field variability in the experiment.

Evaluation of Spring Wheat Seeding Rates (cont.)

Calculating Seeding Rates:

Seeding Rate (lb/ac) = (target plant stand/ft^2) x (TKW (grams))
(Seedling survival rate*) / 10.4

*Seedling survival rate can be estimated by subtracting a small amount for seedling mortality from the germination percentage. In cereals the seedling mortality tends to be between 5-20%. Higher seeding rates tend to have higher seedling mortality rates.

Example:

Target plant stand = 25 plans/ft^2 TKW = 35 g Germination = 99% `

Assumed seedling mortality = 10% Seedling survival rate: (0.99 - 0.10) = 0.89

Seeding rate (lbs/ac) = 25/ft2 x 35 g

(0.89) / 10.4

= 94.5 lb/ac

Data Collection

- Seed test
- Plant stand- plants/ft^2. Counted after emergence and prior to harvest/swathing
- Lodging- on a scale from 1 - 5; 1 being no lodging, 5 being complete lodging. To be done prior to harvest or swathing
- Harvest sample- 1 composite sample from each seeding rate for quality analysis
- General observations throughout the season- example: weed, disease, insect pressure

Grower Requirements:

- Willingness to input trial and see it to completion
- Provide information including field history and agronomic package
- Manage all treatments the same throughout the growing season. Seed, spray, harvest on same day.
- Have access to a weigh wagon, grain cart with a scale, or calibrated harvest yield data.
- Allow Sask Wheat to use collected data for extension and informative purposes
- Must be in good standing with Sask Wheat

Producer Benefit:

- Evaluating agronomic and economic impacts of management decisions, on your farm, under your growing conditions, with your equipment.
- Adapting and fine-tuning research results to work for your farm
- Optimize on-farm practices to improve efficiency, sustainability, and profitability
- Helping create local crop production database