Kansas State University Agricultural Experiment Station and Cooperative Extension Service

Marion County Research and Extension is an equal opportunity provider and employer.

www.ksre.ksu.edu

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May 2018

Knowledge for Life

COOPERATIVE GRAIN AND SUPPLY
WHEAT PLOT TOUR

Thursday, May 17, 2018

Romulo Lollato, K-State Wheat Specialist

Breakfast at 7 a.m.
CG&S Fertilizer Plant
121 Santa Fe, Hillsboro
RSVP CG&S Fertilizer Plant 620-647-8799

Plot Tour at 8 a.m.
Plot Field Intersection of Kanza & Hwy. 58
(East of fertilizer plant about 1/2 of a mile)

StoryWalk® was a great success!
More than 40 families from the county participated during the National Week of the Young Child.
Be on the lookout for it to come back in the future!
Soybean seeding rates and optimum plant populations

Ignacio Ciampitti, Crop Production and Cropping Systems Specialist

Deciding on the right seeding rate is one of the most influential factors for increasing soybean profitability as seed cost is one of the most expensive inputs. Soybean seeding recommendations, row spacing, and planting date are all tied together. The final number of seeds per linear foot of row decreases as row spacing narrows. For example, at a target population of 105,000 plants/acre and 85% germination, 30-in rows will need twice the number of seeds per linear foot as 15-in rows -- 6 vs. 3 seeds per linear foot (Table 1). Seeding rates will need to increase at later planting dates to compensate for the reduction in the growing season since more plants are needed to increase early light interception and biomass production. The environment also exerts an influence on deciding the final seeding rate. Dry and hot conditions require fewer plants to maximize yields; while favorable environments need higher seeding rates to capture the maximum yield potential. Under high-yielding irrigated environments, the final seeding rate should be greater than 160,000 seeds per acre (assuming high % emergence) with a final plant population close to 150,000 plants per acre.

**Summary of past seeding rate studies:** In recent years, a summary of 21 on-farm strip trials and 5 replicated experiment station studies in KS prepared by Kraig Roozeboom, K-State Cropping Systems Agronomist, provided an opportunity to revisit current soybean recommendations. Most of the studies were performed in dryland environments (23 out of 26, with 3 studies under irrigation) and under no-till systems. All were in central and eastern KS counties: Butler, Harvey, Nemaha, Republic, Riley, Saline, & Shawnee.

**Table 1. Recommended soybean plant density and seed spacing.**

<table>
<thead>
<tr>
<th>Target plants per acre (x 1,000)</th>
<th>&lt;45</th>
<th>45-70</th>
<th>70-90</th>
<th>90-115</th>
<th>115-140</th>
<th>&gt;140</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seeds per acre (x 1,000; 85% emergence)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;50</td>
<td>50-80</td>
<td>80-100</td>
<td>100-130</td>
<td>130-160</td>
<td>&gt;160</td>
<td></td>
</tr>
<tr>
<td>Row Spacing</td>
<td>Seeds per linear foot (assuming 85% field emergence)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-inch</td>
<td>&lt;1</td>
<td>1</td>
<td>1</td>
<td>1-2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>10-inch</td>
<td>&lt;1</td>
<td>1</td>
<td>1-2</td>
<td>2</td>
<td>2-3</td>
<td>3</td>
</tr>
<tr>
<td>15-inch</td>
<td>&lt;1</td>
<td>1-2</td>
<td>2-3</td>
<td>3</td>
<td>3-4</td>
<td>4</td>
</tr>
<tr>
<td>20-inch</td>
<td>&lt;2</td>
<td>2-3</td>
<td>3-4</td>
<td>4</td>
<td>4-5</td>
<td>5</td>
</tr>
<tr>
<td>30-inch</td>
<td>&lt;3</td>
<td>3-4</td>
<td>4-5</td>
<td>5-7</td>
<td>7-8</td>
<td>&gt;8</td>
</tr>
</tbody>
</table>

As related to final field establishment, the current recommendations assume 80% emergence. Emergence in the studies ranged from less than 50% to 100%, illustrating the importance of knowing just how many dropped seeds will produce plants in each situation. Studies that have compared planters and drills indicate that the 80% estimate is not far off for planters, but emergence for drills is usually closer to 65%. There is tremendous variability around both of these averages, but it illustrates the need to drop more seed per acre if field emergence is less than the 80% assumed for the current recommendations.

The primary conclusion from the summary of soybean seeding rate studies was that the optimum number of seeds per acre seemed to be highly dependent on the yield level attained at each location. Table 2 depicts the soybean seeding rate summary stratified by yield range.
A) Low yielding environments (test average <30 bushels/acre): Yields were maximized at plant populations of less than 75,000 plants/acre. Optimum final plant population was achieved around 70,000 to 75,000 plants per acre. Thus, if we assume 80% emergence, the optimum seeding rate for this environment will range from 85,000-90,000 seeds/acre.

B) Medium-low yielding environments (average ranged from 30-40 bushels/acre): Yields were maximized with final plant populations around 75,000-80,000 plants/acre, presenting an evident plateau in maximum yield as the number of plants/acre increases beyond 80,000 plants/acre. Seeding rates ranging from 90,000-95,000 plants per acre were required to achieve these final plant populations (assuming overall 80% emergence).

C) Medium-high yielding environments (average ranged from 40-50 bushels/acre): Yields were usually maximized at populations of 105,000-120,000 plants/acre in this yield environment. The break-even point for the association between yield and plant population was set at around 120,000 plants/acre. Increasing the population above 130,000 plants/acre did not increase yields. Considering an average 80% field establishment, optimum seeding rate for this yield environment was 140,000 seeds/acre.

D) High yielding environments (test average above 50 bushels/acre): The highest yields, under irrigation, were achieved with 105,000 plants/acre (or close to 130,000 Seeds/acre with 80% emergence). There were relatively few experiments with yields in this range, so this may not represent a typical response. However, it does illustrate the tremendous ability of soybean plants to adjust the number of pods (and seeds) per plant to available resources. Other studies have shown that, given favorable growing conditions, yields of 80-90 bushels/acre can be achieved with 100,000-120,000 plants/acre.

Seeding rates for high-yielding soybeans
Information gathered from the Kansas Soybean Yield contest shows that maximum yield (more than 90 bushels/acre) could be achieved with 120,000 seeds/acre, with yields tending to decrease from the maximum when seeding rates were above 180,000 seeds/acre. Maximum yield for soybeans did not seem to change for the seeding rate ranging from 120,000-150,000 seeds/acre. Before deciding your seeding rates, also take into consideration potential soil and weather conditions that could affect the success of your final stand establishment.

Always take into consideration the yield potential for each environment when deciding soybean seeding rates. Yield potential is primarily defined by the weather conditions (before and after planting), genetic potential, soil type and supplemental fertility program, and use of best management practices for producing the crop (proper weed, insect, and disease control from planting until harvest). Using seeding rates higher than those recommendations seldom reduced yield, but did increase seeding cost.

Table 2. Recommended soybean plant density and seed spacing

<table>
<thead>
<tr>
<th>Environment</th>
<th>Yield range</th>
<th>Mean yield</th>
<th>Optimum population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>&lt; 30</td>
<td>24</td>
<td>70-75,000</td>
</tr>
<tr>
<td>Medium low</td>
<td>30 - 40</td>
<td>36</td>
<td>75-80,000</td>
</tr>
<tr>
<td>Medium high</td>
<td>40 - 50</td>
<td>43</td>
<td>≈ 120,000</td>
</tr>
<tr>
<td>High</td>
<td>&gt; 50</td>
<td>68</td>
<td>≈ 105,000</td>
</tr>
<tr>
<td>Average</td>
<td>12-78</td>
<td>42</td>
<td></td>
</tr>
</tbody>
</table>

Video of the Month: Mow Lawn at Proper Height
Screen Free Week

Just put it down and walk away. Discover the joy of life without looking at digital entertainment. From April 30-May 6, 2018, unplug with Screen-Free Week. Just think of the possibilities from playing, reading, daydreaming, exploring, and hanging out with family and friends!

Why celebrate this concept? It is evident that digital entertainment is dominating kids lives. Too much screen time is linked to poor school performance, obesity, and attention difficulties.

To help you plan screen-free events with your family, there are handouts available at www.screenfree.org/ under the “Essential Handouts” tab. There are also ideas to keep this going beyond Screen-Free Week under the “Additional Resources” tab.

Spring Cleaning for Your Freezer

If you freeze garden produce in the summer and fall, spring is a great time to clean out your freezer to get ready to store the upcoming season’s harvest. If you have a manual-defrost freezer, you must defrost it at least once a year, or when there is more than a quarter inch of frost over a large area of the freezer surface. A frost-free freezer does not need defrosting, but it still should be cleaned once a year or more often if dirt or food residues are visible. To clean, turn off the power source (unplug), empty the freezer and wipe it with a cleaning solution of one tablespoon of baking soda per quart of water. Rinse it with a cloth dipped in clean water, towel it dry and replace the food. Use a refrigerator or freezer thermometer, and check it often to ensure that the freezer temperature stays at or below zero degrees F. Foods lose quality much more quickly at higher temperatures.

Frozen fruits and vegetables are best when used within eight to 12 months of storage at zero degrees F. After these times, the foods should be safe, though lower in quality. Place foods in the freezer into food groups for ease in locating, so you don’t forget the products you have in the freezer and can enjoy the fruits of your labor at their best quality.


Walk Kansas 5K FOR THE FIGHT

Run/Walk & Kids Run

Saturday, May 5
9:00 am
Chalmers Hall
Kansas State University
Registration opens at 7:45 am
All proceeds benefit the Johnson Cancer Research Center
To register go to WalkKansas.org 5k
Soil Testing
Trouble in your Garden? Your soil might be the problem.
A soil test provides information about the basic fertility of soil.
It is the starting point for determining how much and which fertilizers to use. Soil testing can help produce better crops, lawns, and gardens, as well as save money and prevent runoff of excess nutrients.
Bring your soil sample to the Extension Office today!
2018 Ozsome Camp
June 13—16
★ APPROACHING DEADLINE
Rookie Camp is available for those finishing 1st & 2nd grade this May. Full Time Camp is for those finishing 3rd - 7th grade.
Registration is due May 9.★
The 4-H Endowment Fund is providing scholarships to all members! ($100 for Full Time Campers and $50 for Rookies)

Campference - Leadership Through the Ages
4-H Campference is for youth ages 12-14 (before January 1), and will be held June 26-29 at Rock Springs 4-H Center. Participants will experience the feel of a conference, while enjoying the 'camp' activities Rock Springs 4-H Center has to offer. This is a great transitional opportunity, as tweens go from being a camper to attending educational conferences. 4-H Campference will feature workshops about opportunities in the 4-H program and how to better interact with others.
Register online by May 15!

4H License plates are now available through the Marion County Vehicle Department!

$40.50 Plate cost (one-time charge)
$5.00 County Fee (if not done at renewal time)
$50.00 Donation to 4H (yearly)
Livestock Nominations for KJLS & Kansas State Fair are due JUNE 15! This is for goats, swine, sheep and commercial heifers. We have DNA envelopes, and all other forms, etc. will be found at:

www.youthlivestock.ksu.edu

The Kansas 4-H Dog Conference logo design contest is open to all dog project members. Designs are needed for the 2018 theme “4-H Dogs Under Construction.” Designs must reflect this construction/building theme and be submitted electronically in a JPG format. PDF submissions will not be accepted.

The winning logo design, with professional modifications, will be used for promotional efforts including t-shirts. The winning entry will receive a complimentary registration to the 2018 Kansas 4-H Dog Conference, October 20-21, 2018, Rock Springs 4-H Center. There is no cash value. Entries must be received electronically by Friday, June 1.

The 2018 Spring Beef Show was a great success, bringing in more participants than the past several years. Thank you to everyone who made this possible! Be sure to check out our Spring Beef video on our website or Facebook page!

Mark your calendar!

4-H Council Meeting—May 14

The Marion County Fair is set for Saturday, July 21—Saturday, July 28

Check out our website for even more events and details!

http://www.marion.k-state.edu/4-h/4HUpdate.html
Upcoming Events

April 30-May 6—Screen Free Week
   May 13—Mother’s Day
   May 14—4-H Council Meeting
   May 17—Wheat Plot Tour
   May 28—Memorial Day (Office Closed)
   May 29-June 30—4-H Discovery Days

ALSO INSIDE:
    Video of the Month, Important 4-H
    Deadlines, Gardening Ideas