

5-22-2019

Evaluating Soybean Stands

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Recommended Citation

Anderson, Meaghan J. B. and Vittetoe, Rebecca K., "Evaluating Soybean Stands" (2019). *Integrated Crop Management News*. 2570.
<https://lib.dr.iastate.edu/cropnews/2570>

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Evaluating Soybean Stands

Abstract

As of May 20, an estimated 27 percent of Iowa's soybean crop is planted according to the [USDA-NASS Iowa Crop Progress Report](#). Early-planted soybeans have been exposed to stressful conditions following multiple rainfall events, cold temperatures, and wide temperature swings in the last several weeks. We previously posted an article on [evaluating corn stands](#), and many of the same issues are important when evaluating soybean stands.

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Evaluating Soybean Stands

May 22, 2019

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A very small percent of the soybean crop has emerged in Iowa. As the crop continues to emerge across the state, checking the emergence of the soybeans and identifying any potential issues in the field will be important.

Taking Stand Counts

Stand counts in soybeans are very similar to stand counts in corn. Soybean stand is not as critically linked to yield as with corn; however, early season stand counts are important to evaluate the germination and emergence of the planted soybeans. In addition, look for issues that may require management like diseases, insects, or other problems that could persist through the growing season. Several helpful methods are available to estimate soybean stand.

Traditional method:

1. Measure 1/1,000 of an acre based on row width (Table 1). In 30-inch row soybeans, measure out a length of 17 feet, 5 inches (1 transect) and count the number of plants within the transect.
2. Repeat this process in multiple, representative transects across the field. Typically, at least 6-10 arbitrary transects per field are suggested. Do not intentionally avoid areas

with missing plants, but if one stand count seems unusually low or different than other counts, keep that one separate and make note of it.

3. Average the number of plants per transect and multiply the average number of plants by 1,000 to obtain the estimated plant population per acre.
4. Dig up seedlings and check for symptoms of the following:
 1. Seed rots and seedling blights
 2. Herbicide injury
 3. Insect issues like seedcorn maggot, black cutworm, true armyworm, or even a non-insect pest like slugs
 4. Planter issues (seed depth or missing plants)
 5. If plants are missing entirely, check to see if seed(s) are present where plants should be; soybeans may emerge over days to weeks, so plant stands may improve if counts are taken very early

| Row width (inches) | Row Length representing 1/1000 acre |
|--------------------|-------------------------------------|
| 30 | 17 ft, 5 in. |
| 20 | 26 ft, 2 in. |
| 15 | 34 ft, 10 in. |
| 10 | 52 ft, 3 in. |
| 7 | 74 ft, 9 in. |

Table 1. Feet of row representing 1/1,000 of an acre at different row widths (Source: Corn and Soybean Field Guide, IPM 1).

Alternative methods

It is not uncommon to see 15-inch, 10-inch, or sometimes even 7.5-inch row soybeans, especially if planted with a drill. Taking stand counts using the traditional method above can be arduous if soybeans are planted in narrow rows, so an alternative method may be more conducive to quickly getting stand count estimates.

Counting plants per foot of row: One alternative is to estimate the total plant stand by counting of soybeans in an individual foot of row using Table 2. Like other methods, multiple transects are necessary to get a representative estimate of the stand across a field. These counts can be done more quickly than measuring 1/1,000 of an acre, but may require more counts if stands are particularly uneven.

| Plants/foot of row | Plants per acre | | | | | | |
|-----------------------|--------------------|---------|---------|---------|---------|---------|---------|
| | Row width (inches) | | | | | | |
| | 38 | 36 | 30 | 20 | 15 | 10 | 7 |
| 1 | 13,800 | 14,500 | 17,400 | 26,100 | 34,800 | 52,300 | 74,700 |
| 2 | 27,500 | 29,000 | 34,800 | 52,300 | 69,700 | 104,500 | 149,300 |
| 3 | 41,300 | 43,600 | 52,300 | 78,400 | 104,500 | 156,800 | 224,000 |
| 4 | 55,000 | 58,100 | 69,700 | 104,500 | 139,400 | 209,100 | 298,700 |
| 5 | 68,800 | 72,600 | 87,100 | 130,700 | 174,200 | 261,400 | 373,400 |
| 6 | 82,500 | 87,100 | 104,500 | 156,800 | 209,100 | 313,600 | |
| 7 | 96,300 | 101,600 | 122,000 | 183,000 | 243,900 | | |
| 8 | 110,000 | 116,200 | 139,400 | 209,100 | 278,800 | | |
| 9 | 123,800 | 130,700 | 156,800 | 235,200 | 313,600 | | |
| 10 | 137,600 | 145,200 | 174,200 | 261,400 | | | |
| 11 | 151,300 | 159,700 | 191,700 | 287,500 | | | |
| 12 | 165,100 | 174,200 | 209,100 | 313,600 | | | |
| 13 | 178,800 | 188,800 | 226,500 | | | | |
| 14 | 192,600 | 203,300 | 243,900 | | | | |
| 15 | 206,300 | 217,800 | 261,400 | | | | |

Table 2. Plant density for common row widths based on the average number of plants/foot of row (Source: [PM 1851 Soybean Replant Decisions](#) Table 3).

Hula Hoop Method: Another alternative method to take stand counts uses a hula hoop.

1. To use this method, toss a hula hoop to arbitrarily select an area for a stand count.
2. Count the number of plants inside the hula hoop and multiply the number of plants by a factor to estimate the number of plants per acre (Table 3). With this method, count the number of plants inside the hula hoop diameter and take the number of plants times a multiplication factor based on the diameter of the hula hoop. If a hula hoop does not have the exact diameter of those listed in the table below, determine the estimated stand by using the equation [Population = Plants Counted / (3.14 * hoop radius * hoop radius / 43,500)]. There are also tables available with plant populations already calculated based on the number of plants and hula hoop diameters ([see Table 3 in this link](#)).

| Hula hoop diameter (inches) | Multiplication factor |
|-----------------------------|-----------------------|
| 28 | 10,000 |
| 30 | 8,900 |
| 32 | 7,800 |
| 34 | 6,900 |
| 36 | 6,200 |

Table 3. Several hula hoop diameters and multiplication factors for stand counts in soybeans.

1. Average the stand counts and divide by the total number taken to determine an estimated average plant stand.
2. Like the traditional method, take multiple counts at various locations (at least 10 arbitrary locations) in the field. This method is often easier to get arbitrary counts but may require more counts than the traditional method to get an accurate idea of stand if the population is uneven or seeding rates were low. Remember, if one count doesn't seem to fit the other counts, keep that number separate and make note of where that area is at in the field. Investigate to figure out what may have reduced the stand in that area. Consider how wide spread the issue is and whether it has a pattern or is seemingly random.

Final stands are often at least 10-20% lower than the original seeding rate. With early-season soybean planting, a final stand of 100,000 evenly spaced plants is a desired, but soybeans have a significant ability to branch and yield well even in thinner stands.

Replant considerations

If the emerged soybean population is significantly lower than expected, replanting or, more likely, "thickening up" soybeans may be considered. Unlike in corn, rarely do soybean fields require replanting, but planting additional soybeans on an offset pattern (typically angled or perpendicular) from the original rows is usually sufficient to improve stands. Due to the soybean plant's growth habit and reproductive capabilities, soybeans can coexist at different crop development stages without issue.

In order to determine whether replanting is likely to be of benefit, consider the factors discussed below:

- Consider the yield potential of the current stand for the original planting date using [Soybean Replant Decisions \(PM 1851\)](#).

1. In general, replanting should be considered if uniform stands are less than 75,000 plants per acre when planted prior to mid-May or less than 50,000-60,000 plants per acre when planted late May into June.
 2. Soybeans can compensate for low stands through increased branching and pod set.
- Be sure to factor in replant costs like fuel, seed, and time/labor.
 - Consider other factors:
 1. Soybean seed treatments are often not necessary for replanted soybeans due to warmer soils at the time of planting, but consider a fungicidal seed treatment if the field is prone to seedling diseases.
 2. Low or uneven soybean populations may be more susceptible to weed issues due to lack of early-season suppression from the plant canopy, so additional postemergence herbicide may be necessary. Additionally, reference herbicide labels for any products already applied to the field to be certain residual products do not disallow replanting.
 3. Maturity selection, seeding rate, and row spacing may all need adjustment due to the shorter timeframe to harvest and lack of competitive ability of late planted soybeans. If already planting a well-adapted soybean variety to the area, do not change maturity selection unless replanting occurs in late June, but do consider increasing seeding rate or narrowing row spacing to allow for more competition with weeds.

Taking the time to determine estimated stand counts after crop emergence is no simple effort. As more of the soybean crop emerges, this practice, as well as checking the plants for potential insect, disease, or herbicide issues will be key to making management adjustments now or understanding problems later in the growing season. If necessary, the resources above will aid decision-making in the identification of possible issues and determining if replanting or “thickening up” soybeans is necessary. Also, feel free to contact your local extension field agronomist if you have any questions.

Category: Crop Production

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Crop:

Soybean

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soybean replant decisions

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