

THE LEADING EDGE

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A PUBLICATION DEDICATED TO MAXIMIZING YIELD POTENTIAL

Producing the Perfect Crop: Guidelines for Soybean and Corn Producers

The business is agriculture and the rule is variability. As producers strive for the perfect crop each year, they plan, analyze, and gamble. They deal with the unexpected and manage the less-than-desirable. And still, much of what determines yield is out of producers' control. Producers can, however, be aware of the many factors that determine yield, and work to utilize best practices on those factors that can be controlled.



Fall strip till is one way to handle residue and often makes an ideal seedbed for planting.

Preparing for Planting

Whether you are planning a corn-soybean rotation or corn-on-corn acres, in reduced tillage situations, fall is the time to begin residue management. Proper management will result in an improved seedbed, stronger plants, and higher yields. Set your combine head to leave stalks of a manageable height. For soil into which corn will be planted, consider a fall nitrogen application to break down residue left behind at harvest.

If residue management cannot be completed in the fall, there are options other than conventional tillage to make no- and minimum-tillage-planting possible in the spring. Attaching residue managers to planters or vertical tillage tools are just two of the spring residue management options available to producers.

A fall soil test is also recommended in addition to spring testing—It is the best time to sample for soybean cyst nematodes (SCN). And, as fertilizer costs rise, producers will benefit by developing a nutrient management plan based on accurate and recent data. Applying only needed nutrients saves on input costs and is also an ecologically sound practice.

Soil tests can help reduced-tillage producers know if their nutrients have become stratified. Producers using precision farming tools may need soil samples from specific grids, awhile those who still find traditional practices

the best fit may continue to mix soil samples from several areas. A sturdy soil probe that reaches 24 inches into the soil, where nutrients may be carried by moisture, might be needed.



When managed properly residue provides excellent ground cover between rows, while cleared seed zones provide a residue free growing area.

The Perfect Crop From the Perfect Hybrid

Another key preparatory step is hybrid selection. For both corn and soybeans, it is most important to consider yield potential, along with maturation time period and disease resistance in addition to your soil type and tillage practice when selecting hybrids. Discuss the different hybrids with your seed dealer and agronomist to find the seed for your operation.

For soybeans, selecting your seed hybrid can only be completed successfully if you know your soil and its history. Select hybrids that stand up to diseases or insects you commonly encounter. In many states, a SCN resistant variety will be important. It is also important the hybrid does not allow the population density of SCN to keep building in the field.

For corn, another key is selecting a variety with reasonable grain moisture content—one that works well with the area in which they will be grown. Standability without increased lodging and biotech options should also be considered.

And, for both corn and soybeans, varying your selected hybrid from year to year will make sure any congenital resistances to diseases or insects are maintained, not broken because those pests adapt to the variety.

When to Plant

Soybeans should be planted as early as possible. In many management plans, soybeans are planted after corn because there is a misconception that soybeans are less susceptible to lower yields if the planting date is later. However, in Iowa studies, soybeans planted earlier in cool soil had a 79% chance of achieving a higher yield if planted by the last week of April. Source: Iowa State University Agriculture Extension.

While soybeans germinate more quickly in 77 to 86° soil, the seed will begin to germinate in 50° soil. In this case, emergence may be delayed for 2 to 3 weeks. So, if producers can balance the planting of corn and soybeans, there is a potential for higher yields with earlier planting. When managed properly residue provides excellent ground cover between rows, while cleared seed

zones provide a residue free growing area. The key to achieving benefits from earlier soybean planting is good management. Producers must avoid "mudding in" seeds in wet soil. Seeds should be planted at a depth of 1 to 1 1/2 inches.

To plant corn, soil temperatures should be 50°, or be rapidly increasing to that mark. Again, soil needs to be dry enough to avoid sidewall smearing and compaction, or proper tools for planting into these conditions must be used. For corn, research has shown a small yield loss with very early planting dates and larger yield losses with significantly delayed planting dates.

Growers beware, however: as beneficial as early planting for these crops can be, don't let the desire to plant early interfere with good judgment.



Nutrients Are Critical in Early Corn Development Stages

The first critical stage of corn plant development is emergence. Corn does not compensate well for poor stands, so establishing a uniform stand is key. Today's hybrids

handle stress associated with high plant populations well, and it is wise to adjust your plant population upward until you reach the optimum level.

The second critical stage is when the plant determines the rows and potential kernels per row. Row number is determined strongly by genetics, and stress prior to the V12 stage has to be significant to change the pre-determined number of rows on the ear.

Development of kernels-per-row is more volatile and can be affected by field conditions. Controlling pests and monitoring plant health are critical during the emergence and V12 stages.

However, the most important factor in kernel-per-row development may be nutrient supply. Jerry Baysinger, a farmer in Nebraska, pinpoints correct placement as the most important nutrient-management factor. "Mother Nature can throw curve balls, and for that reason, it's important to determine the best placement. You've got to give yourself a chance to get ahead," said Baysinger.

Baysinger has found that in his strip till operations, this means placing nutrients, especially nitrogen, deep below the corn plant. Roots need to reside in fertilizer rich zones. "Conventional tillage operations often utilize a 2x2 placement rule, but we have found that in our strip till, placing nutrients below the seed is best."

Pollination and
kernel

Because nitrogen deficiency can
negatively affect ear development and

development are also key stages in corn development. Read more about what you can do to facilitate your pursuit of the perfect ear.

is linked to kernel abortion, producers should make sure plants have access to enough nitrogen. Choosing the right tools for nitrogen placement and determining the time to apply is critical. Starter fertilizers placed in the optimal location give young roots access to needed nutrients like nitrogen throughout the growing season.

The key to successful starter fertilizer use is in the correct placement, which is achieved by using the best fertilizer application equipment to ensure that producers use less fertilizer, save money, and facilitate high yields. Choose models that allow for depth and down-pressure adjustments to satisfy specific conditions.

Row Spacing and Canopy Closure Key for Soybeans

One factor proven to increase yields and achieve the perfect soybean crop is row spacing. Studies in Iowa showed that planting soybeans in rows narrower than 30 inches has the potential to increase yield. Those increases were 4.5 bushels per acre when soybeans were planted in 15-inch rather than 30-inch rows across all seeding rates. In Canada and the upper Midwest, data supports a yield improvement of 2 to 9 bu./acre.

Don't write off soybeans!
The highest recorded soybean yield is 155 bu./acre.

Narrower rows mean the canopy in soybean field will fill in more quickly, closing the rows and increasing light interception. Light interception is critical to pod and seed-filling stages and it promotes rapid growth.

To obtain proper canopy closure in much of the Midwest, the recommended plant population at harvest is 100,000 plants per acre. It is important to note that the soybean plant has the ability to adjust and will produce more branches and pods in lower populations. Weed and pest management are also critical to canopy closure. Soybeans are sensitive to early competition from weeds. Soybean stands can be improved 10 to 20 percent if a fungicide/insecticide treatment is applied when planting. Weekly scouting during the growing season is also important to identify and eradicate in-season stressors



Proper residue management begins at harvest, not just at planting time.

that may develop.

To plant soybeans in 15-inch rows, producers need to clear the hurdle of buying what is likely a second set of equipment designed specifically for 15-inch rows. This once meant a new planter, but new planters pull double-duty. They have row-units on 15-inch increments, but every-other unit can be raised for corn planting. Fertilizer application tools and residue managers are also available in models suited to narrow rows.

Achieving the Dream

The perfect crop is a myth—in no season will all environmental and management factors align to maximize yields in both corn and soybeans. But knowledge of your soil, carefully planned seeding and planting, targeted nutrient management, and a willingness to test and adapt new practices will go a long way toward achieving that elusive goal.

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