

Why kernels come in all shapes, sizes

WHY do corn seed kernels vary in size, shape and weight? University of Nebraska agronomists Roger Elmore, Ken Russell and Lori Abendroth offer the following explanation:

Usually, large rounds come from the butt of the ear, flats from the center, and small rounds and small flats from the tip. Medium rounds can come from either end of the ear. Seed weight increases when going from flat to round, and from small to large seed. Farmers probably still worry too much about seed size and weight — a factor important to old plate planters, but less important to today's planters — while almost ignoring test weights.

Why do corn kernel shapes differ? A brief discussion of tasseling and silking processes helps to understand this better. Pollen-shed for modern hybrids occurs over a five- to eight-day period in good conditions. High temperatures hasten this process, and drought delays it. Pollen-shed begins about three-fourths up the tassel and then proceeds upward and then downward from the starting point. Older hybrids had large tassels producing pollen for up to two weeks. Modern hybrids (and inbreds)

Key Points

- Kernel type and shape varies by position on ear.
- Variation in size is due to the timing of pollination and kernel position.
- The heaviest kernels will be found at the butt of the ear.

have smaller tassels than the older hybrids.

Silks of some modern hybrids emerge before pollen-shed and some a few days after. With good conditions, most modern hybrids usually shed pollen and silk about the same time. Silks are receptive to pollen for about seven days. Again, pollen tube growth and eventual ovule (kernel) fertilization are temperature and moisture dependent.

Variation in kernel size is due to the timing of ovule fertilization, and this is dependent on kernel position on the ear. Kernels an inch or two from the butt end silk first and thus are fertilized first. This is followed by those just above the butt-end kernels, working toward the tip. Tip kernels not fertilized within four to six days of butt kernels either fill poorly or abort. Some have



KERNEL SIZE: Corn kernel size and shape varies by the kernel's position on the ear. Flat kernels grow in the middle while rounds are on the end. The biggest kernels are on the butt end; the smallest on the tip.

said that kernels fill more like "pigs at a trough" than if they were attached to a manifold. The first ones to the trough get the most. Thus, the kernels at the butt are larger and those at the tip are smaller.

University of Nebraska research related to post-black-layer dry-matter accumulation measured kernel weights on several hybrids from three sections of

ears. The kernel weights varied in this order: Butt to midsection to tip, 0.96-0.99 to 0.93-0.95 to 0.72-0.78 ounce per 100 kernels, respectively. Therefore, the majority of kernels on the ear are fairly similar in weight (0.93 to 0.99 ounce per 100 kernels), except for the tip kernels which are significantly less.

Source: Iowa State University Extension Communications

Tune up planter for higher yield

PLANTER maintenance now will increase your corn yield potential next year, says Bob Nielsen, Purdue Extension corn specialist. "If the metering unit does not put seed down in the ground uniformly and evenly, there will be uneven germination and emergence," he says. "Uneven emergence can cause a 10% to 15% reduction in yield, while inconsistent germination can cause a 3% to 5% yield loss."

From 1987 to 1996, Nielsen measured plant spacing variability in Indiana and Ohio cornfields. During that time, 350 fields were sampled, and the standard deviation, or the measure of variation in a group, was figured. The standard deviation of plant spacing was 3 inches or less in about 16% of the fields. In 60% of the fields, spacing variability was 4 to 5 inches, while 24% of the fields had

Key Points

- Proper planter maintenance is key to getting a good stand, especially in corn.
- Uneven row spacing reduces yield potential; plants compete with each other.
- Have a dealer go through your planter, or make time to tune it up yourself.

6 inches or more of spacing variability, Nielsen says.

"Typically, farmers want a plant spacing variability of 2 inches," he says. "Two and a half bushels per acre are lost for every 1 inch increase in the standard deviation of plant spacing."

Plant spacing variability is typically related to misadjusted or malfunctioning planter mechanisms.

Implement dealers offer service on

planters, but you can do it on the farm, too, Nielsen says. For specific instructions, see the operator's manual for your planter.

What to check

A general checklist includes:

- With plate-type planters, match seed grade with correct planter plate.
 - With finger-pickup planters, check for wear on the back plate and brush. Use a feeler gauge to check tension on fingers, then tighten them correctly.
 - Check for wear on double disk openers and seed tubes.
 - Make sure sprocket settings on the planter transmission are correct.
 - Check for worn chains, stiff chain links and improper tire pressure.
 - Lubricate all chains and grease settings.
 - Make sure seed drop tubes are clean and clear of any obstructions.
 - Clean seed tube sensors if you are using a planter monitor.
 - Make sure coulters and disk openers are aligned properly.
 - With air planters, match the air pressure to the weight of the seed being planted.
 - Check the planter's depth control settings to make sure they are accurate.
 - Check metering units on fertilizer and insecticide applicators.
- "The time and money spent on maintenance now is a great investment because of the cost savings and potential yield gain," Nielsen says.

Source: Purdue Extension



PLANTER BONUS: A properly tuned corn planter can increase yield potential.

Soybeans push to 155 bushels

MISSOURI farmer Kip Cullers has done it again. With a yield of 154.74 bushels per acre, he has set a new world record for soybean production, topping the record of 139.39 bushels per acre he set last year.

Cullers, who farms near Stark City, Mo., harvested the 154.74-bushel-per-acre beans on Oct. 6 from a 40-acre field. The yield average, confirmed by the Missouri Soybean Association, is 15.35 bushels per acre higher than what he harvested from the same field in 2006.

"The beans this year did a little better than I expected," says Cullers. In August, he wasn't sure the beans were putting on enough pods at the top of the plants to produce a record yield. "But the plant health of these beans was excellent, and this variety, Pioneer 94M80, fits my farm well. It ended up with a lot of pods."

Cullers planted the same variety last year and sprayed Headline fungicide both years.

"A big factor in the 2007 yield was the Monosem planter I used to plant the beans this past spring. It did a better job of seed placement than the drill I had been using," he adds.

With the Monosem planter, Cullers planted 300,000 soybean seeds per acre in twin rows spaced 7.5 inches apart. The rows are on 30-inch centers. The field was conventionally tilled and irrigated.

Cullers is often asked by other growers what to do to get high yields. He says the No. 1 requirement is to plant the best genetics for your area.