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## What is the optimal time to harvest grain?











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N

#### Not until its physiologically mature...

#### Corn



Kernel black layer

Placental cells that die, discolor, and collapse into a thin layer that blocks photosynthate movement into the kernel

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# Soybeans







#### When is corn and soybeans ready to harvest and how can yield estimates be calculated?









#### As the investigator...

Corn & Soybean Maturity
Factors that affect yield
Parts of an Ear of Corn
Calculate yield estimates



Investigative Assignment: Create a display outlining how yield is determined and describe factors that affect why a yield could be outstanding or poor.







#### High Yielding Crops...

- Are fertilized according to soil tests for the production level desired.
- Selected for the best hybrid suited to the farming operation.
- Planting at appropriate time, correct population and spacing.









#### High Yielding Crops...

- Have no or limited competition from weeds, diseases, and insects.
- Are managed with cultural practices to maximize the rate and length of time of dry matter accumulation in the grain.









#### **Estimating Yields for Corn**

It can be helpful when making crop management decisions such as:

- when to harvest a field or
- in making grain marketing decisions.
- It is not always accurate though, so should be used with caution.







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#### Parts of a Corn Ear

#### Do you know what is what?

Ear Node Husks Stem Kernels Ear leaf Silks



Image: NCGA





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### Parts of a Corn Ear Silks Ear leaf Kernels. Stem -Husks' Ear Node

Image: NCGA





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#### **Parts of a Kernel**

### Do you know what is what?

Tip Cap The germ The pericarp The endosperm







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#### Parts of a Kernel

A kernel of corn contains:

61.0% Starch 19.2% Feed 3.8% Oil 16.0% Water









#### Count the kernels on a cob



1. Count the number of rows (kernels around the cob)
<u>Answer\_\_\_\_</u>

2. Count the number of kernels/row

Answer \_\_\_\_\_

**3. Total number of kernels on the cob (rows x kernels/row)** 





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#### **Estimating Corn Yields**

- Simplest & Least Accurate Method
- Adjusting for Population and Seed Size
- Using Ear Counts to Estimate Ears per Acre
- Improving Estimate of Ears per Acre







Simplest & Least Accurate Method

Example 1:

You count 12 rows per ear and 50 kernels per row to equal 600 kernels per ear. 600 x 0.300 = 180 bushels/acre

Using: Table 1. Multipliers based on ears per acre and kernel size to calculate expected yield. Determine the number of kernels per ear and multiply that number by the correct multiplier to make a yield estimate.







- Adjusting for <u>Population</u> and <u>Seed Size</u> Example 2:
- 600 kernels per ear
- If you assume 25,000 ears per acre, then:
- In an average year, 600 x 0.278 = 167 bushels/acre.
- In a highly stressful year, kernel size will be smaller and 600 x 0.227 = 136 bushels/acre.
- In a highly productive year, kernel size will be larger and 600 x 0.357 = 214 bushels/acre.







- Using <u>Ear Counts</u> to Estimate <u>Ears per Acre</u> Example 3:
- You count 12 rows per ear and 50 kernels per row to equal 600 kernels per ear. You count 26 ears in 1/1,000th acre to equal 26,000 ears per acre.
- In an average year (medium kernel size), 600 x 0.289 = 173 bushels/acre.







Improving Estimate of Ears per Acre

Example 4:

- 600 kernels per ear. You count 145 ears in 100 feet of row, which equals 25,265 ears per acre.
- Option 1: Round 25,265 to 25,000 ears per acre and use the multiplier in Table 1
- In an average year, 600 x 0.278 = 167 bushels/acre.







### Let's see how these methods compare!

Simplest & Least Accurate Method

**EXTENSION** 

Using Ear Counts to Estimate Ears per Acre
 30 inch rows = 17.5 inches
 (count how many ears are in 17' 5")

Improving Estimate of Ears per Acre (count how many <u>ears</u> are in 100 feet of row)





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#### How did the methods compare?









#### Yield estimates are only as accurate as the field area and data that was sampled!









#### As the investigator we looked at:

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**EXTENSION** 



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