



5. (5) Circle what is the current University of Nebraska recommendation for collecting standard, surface soil samples for general fertility analysis (ie pH, Bray-1 P, K, etc.)?

- 15-20 cores to a depth of 8 inches from an area no larger than 40 acres
- 6-8 cores per acre
- 10 cores from an area to a depth of 12 inches
- 3-4 cores to a depth of 36 inches from an area no larger than 40 acres

6. (5) List three levels of vehicle guidance assistance:

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_

7. (5) Circle spatial data sets that can be downloaded for free:

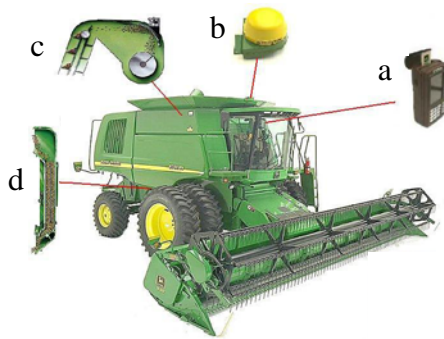
- Digital Elevation Model
- Field Boundary
- Soil Survey
- Digital Orthophoto Quads
- Yield Maps
- Remote Sensing Imagery

8. (10) List four measurement principles used by existing on-the-go soil sensors

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_

9. (5) Name the indicated components of a **yield monitoring system**:

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_



10. (10) Define the difference between **systematic** (grid) and **adaptive** (zone) soil sampling strategies:

11. (20) A particular area of the field produced the following yield:

Season	Crop	Yield, bu/acre	Field Average, bu/acre
2000	Corn	131	140
2001	Soybeans	71	70
2002	Corn	133	166
2003	Soybeans	55	63

Indicate whether this area should be treated as high yielding, low yielding or variable. Show your calculation.

*Hint: you may use the following equations:*

$$Yield_{relative} = \frac{Yield_{actual}}{Average_{year}}$$

$$AverageYield_{relative} = \frac{Yield_{relative}^{year1} + Yield_{relative}^{year2} + \dots + Yield_{relative}^{yearN}}{N}$$

$$StDevYield_{relative} = \sqrt{\frac{(Yield_{relative}^{year1} - AverageYield_{relative})^2 + \dots + (Yield_{relative}^{yearN} - AverageYield_{relative})^2}{N - 1}}$$

$$ClassYield = \begin{cases} \text{Always High} & \text{if } AverageYield_{relative} - 1 > StDevYield_{relative} \\ \text{Always Low} & \text{if } 1 - AverageYield_{relative} > StDevYield_{relative} \\ \text{Variable and Average} & \text{Otherwise} \end{cases}$$

12. (5) Circle three types of **geographic feature** representations in GIS:

- Dash
- Point
- Grid
- Line
- Polygon
- Spheroid
- Triangle
- Datum