Intro to Agriscience
Precision Agriculture Lesson 2 Quiz
Study Guide – ANSWER KEY

NOTE: The questions or statements below are not in the same order as the information found in your notes. You may need to skip around in order to find the answers.

1. What two things does any electronic technology consist of?

   Hardware and Software

2. A ***monitor*** takes in signals from ***sensors***, interprets whether any changes need to be made, and then sends a signal to the ***meter*** to make the corrections.

3. Precision Ag maps are put together in ***layers***, starting with yield.

4. Explain 2 uses for electronic collars in livestock production. *Note: tying them up or restraining them is not an acceptable answer.*

   It can track feed intake, milk output, detect heat, act as part of "virtual fencing," detect onset of sickness, etc.

5. What are the three main types of hardware used in Precision Agriculture?

   Monitors, Sensors and Meters

6. Using words and arrows, explain the parts of a "Simple Delivery System" used in Precision Ag.

   Supply tank →→ Pump →→ Flow Meter →→
   Flow Sensor →→ Application Device (i.e. sprayer)

7. Give five different ***inputs*** used in producing a crop.

   Seed, Irrigation, Fertilizer, Herbicides, Fungicides, etc.

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8. Name 5 different maps that could be utilized in Precision Ag.

   Yield Maps, Subsoil Moisture Maps, Organic Matter Maps, Phosphorous Maps, Fertilizer Application Maps, Irrigation Applications Maps, etc.

9. The ***hardware*** used in Precision Agriculture is the mechanical equipment.

10. What are 3 things related to seeds that can be changed using Precision Agriculture?

    Seed/Hybrid Variety, Seed Spacing/Rate, Seed Depth

11. ***Software*** is the computer program that controls what hardware does.

12. Sensors, meters and monitors are examples of ***hardware***.

13. Explain 2 things that can be “sensed” in an animal’s body using Precision Ag.

    The last time animal ate or drank, body temperature, heart rate

14. Scales, hygrometers, thermometers and lasers are examples of ***meters*** used in Precision Agriculture.

15. What is a “SmartFirmer?”

    A sensor being used in precision planting. It is a very complex and highly technical set or “array” of sensors.

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16. What does a moisture sensor do?

    It measures the amount of moisture in the grain or combine.

17. Where is a moisture sensor located?

    On a combine near the flow of clean grain.

18. A ***Mass Flow*** sensor is used to measure the weight of grain being harvested.

19. A ***flow meter*** works with flow sensors to control the amount of fluid that is allowed to flow through a sprayer.

20. What is something about irrigation that can be controlled using Precision Agriculture?

    When it is time to water and how much water is applied.

21. Because of ***scalability***, an ag producer does NOT have to be a "big farmer" to use Precision Agriculture.

22. An agricultural producer does not have to buy all new ***equipment*** in order to use Precision Agriculture.

23. "Pros" of Precision Agriculture include the following:
    1. An ag producer can minimize the risk to the ***environment*** by reducing nitrate leaching and runoff.
    2. ***GPS*** allows a field to be surveyed with ease.
    3. Fields can be subdivided into smaller plots based upon their specific ***requirements***.
    4. You can make more informed ***decisions***.
    5. You can get more ***information*** about the operation.

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24. "Cons" of Precision Agriculture include the following:
    1. Initial ***investment*** may be high.
    2. It may take a very long time to gather the needed ***data***.
    3. It may be difficult for older producers to learn to ***analyze*** the data.

25. Where does a GPS receiver get its information?

From a constellation of 27 Earth-orbiting satellites (24 in operation and three extras in case one fails). Each of these 3,000- to 4,000-pound solar-powered satellites circles the globe at about 12,000 miles, making two complete rotations every day. The orbits are arranged so that at anytime, anywhere on Earth, there are at least four satellites "visible" in the sky.

https://electronics.howstuffworks.com/gadgets/travel/gps.htm

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