

Objective: Students will learn that scientific and technological advances have greatly impacted the agriculture industry. Farmers continue to adapt to the changing technologies to grow more with less land.

Knowledge Testing: Knowledge on Ag Technology can be tested through our provided worksheets or visit our Kahoot! account for fun, interactive quizzes.

Kahoot!



Materials

Ag Technology, Summary

Ag Technology, Matching

Ag Technology, Invention

Ag Technology, Zone Maps

Free materials are provided on our website at www.growingagriculturetogether.com

Checklist

- Watch "What is Agronomy? Ag Technology"
- Ag Technology, PowerPoint
- Ag Technology, Summary
- Ag Technology, Matching
- Ag Technology, Invention
- Ag Technology, Zone Maps

For more information visit www.growingagriculturetogether.com or check us out on...

GROWING AGRICULTURE *together.*

AG TECHNOLOGY

Throughout history, scientific and technological advances have greatly impacted the agriculture industry. Farmers continue to adapt to the changing technologies to grow more with less land. Today, only 2% of the population is involved with production agriculture. These farmers have specialized operations and feed about 166 people annually.

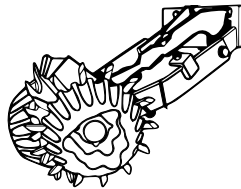
AG TECHNOLOGY

Ag Technology, also known as Precision Ag, helps farmers make smart, efficient, and responsible decisions about how and when they plant, grow, irrigate, harvest and transport crops.



GPS

Use of satellites to track field data



HARDWARE

Equipment hardware to ensure accuracy



SOFTWARE

Computer & phone apps to help with efficiencies

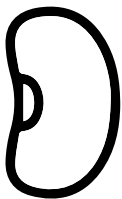


DATA

Explanation of results through technology

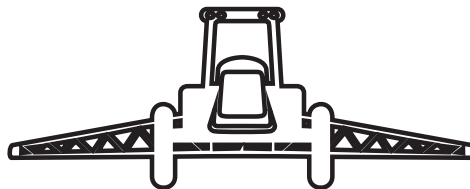
VARIABLE RATE APPLICATION

With variable rate application, farmers use computers and satellites to place different rates of an input such as water, seed or fertilizer where the plant can best use them based on soil tests, yield, imagery, or other soil characteristics.



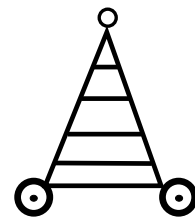
SEED

Planting the correct amount of seed



FERTILIZER

Applying the right amount of fertilizer



WATER

Applying the right amount of water

FUTURE OF PRECISION AG

SENSOR TECHNOLOGY ● DRONE SCOUTING ● DRONE SPRAYING ● DRIVERLESS EQUIPMENT

Name: _____

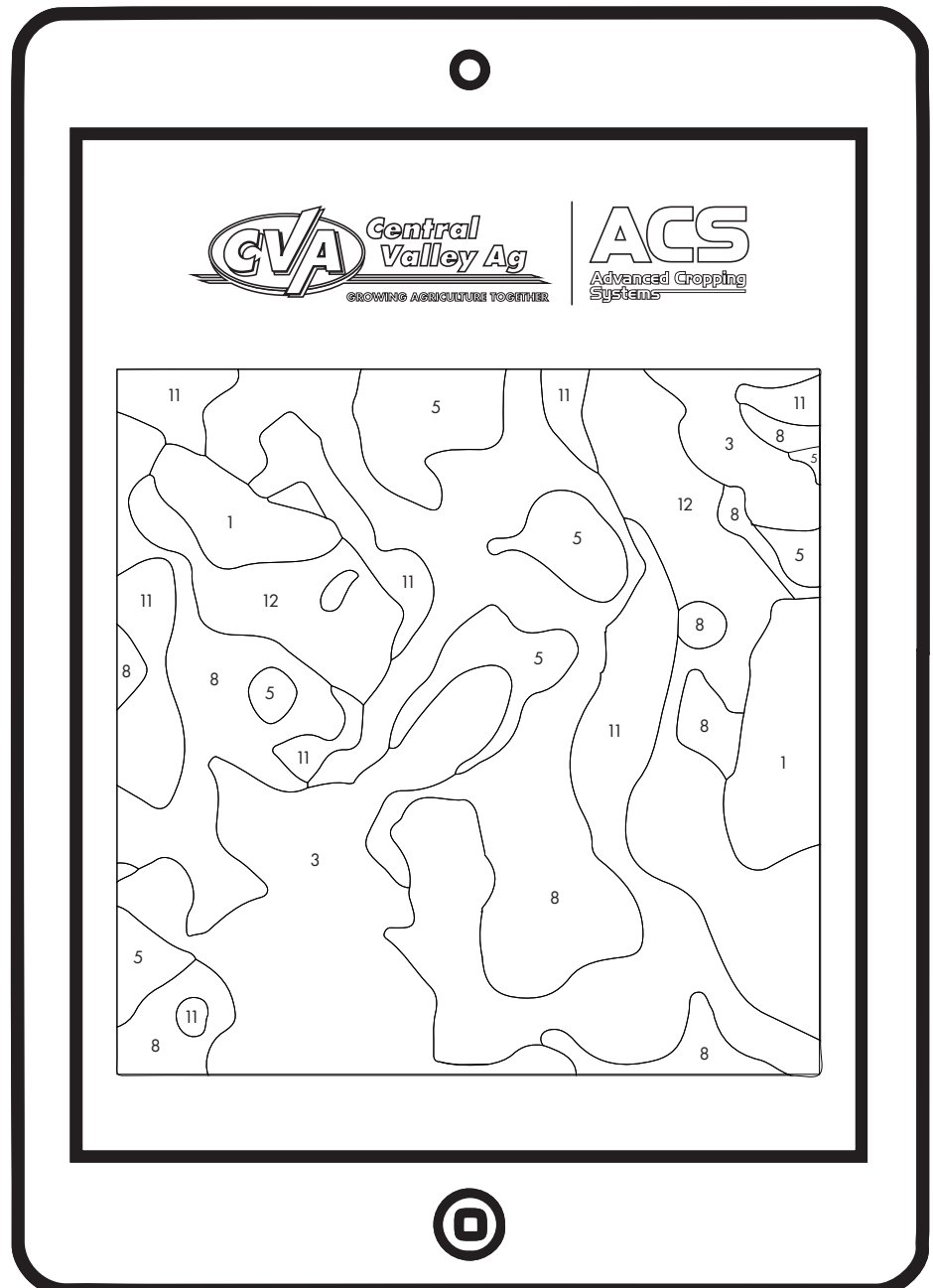
ZONE MAPS

With variable rate application, farmers use computers and satellites to place different rates of an input such as water, seed or fertilizer where the plant can best use them based on soil tests, yield, imagery, or other soil characteristics. One map that can help farmers make decisions is a yield zone map. Zone maps divide fields into zones based on yield potential.

COLOR BY NUMBER:

Using the key below, color the map by matching the numbered zone to the color in the key.

- 1** Hilltop, Ridge, or High Sloping Area
- 2** High Producing Depression
- 3** Low to Med Producing Depression
- 4** EC High and Low Yield Potential
- 5** EC Med and Low Yield Potential
- 6** EC Low and Low Yield Potential
- 7** EC High and Med Yield Potential
- 8** EC Med and Med Yield Potential
- 9** EC Low and Med Yield Potential
- 10** EC High and High Yield Potential
- 11** EC Med and High Yield Potential
- 12** EC Low and High Yield Potential



Soil electrical conductivity (EC) is a measure of the amount of salts in soil. It is an important indicator of soil health.

Name: _____

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AG TECHNOLOGY

With human population projected to grow to nine billion or more by 2050 - that's up from the 7 billion here today - farmers are needing to grow more food on less land. Be Creative! What is something that you would like to invent that would help farmers become more efficient in their production? Fill out the form below about your invention.

MY INVENTION

WHAT IS IT CALLED?

HOW DOES IT WORK?

**DRAW A PICTURE
OF YOUR INVENTION**

WHY WOULD THIS BE USEFUL TO FARMERS?

Name: _____

AG TECHNOLOGY

Ag Technology, also known as Precision Ag, helps farmers make smart, efficient, and responsible decisions about how and when they plant, grow, irrigate, harvest and transport crops. Read about the newer ag technologies below and the efficiencies that have helped farmers on their operation. Then on the next page, match the ag technology to the efficiency.

AG TECHNOLOGY & EFFICIENCIES

VARIABLE RATE IRRIGATION

- Less erosion and better water infiltration rate on side hills by reducing water runoff
- Less water ponding in depressions due to speeding up the pivot through the low areas

VARIABLE RATE SEEDING

- Increased corn yield by seven bushels per acre by increasing the plant population in historically high yield potential areas of the field
- Increased soybean plant height and yield in poor areas of the field by increasing the soybean plant population on knobs, hilltops, and high pH areas

VARIABLE RATE NITROGEN

- Reduced Nitrogen loss in low areas of the field where water ponding happens by applying less overall nitrogen in these areas
- Increased corn yield by 12 bushels per acre by applying more nitrogen in historically high yielding areas of the field

AQUASYSTEMS MOISTURE PROBE

- Protecting our most important natural resource by reducing the number of irrigation passes throughout the season by knowing plant available water and crop root depth

AG LEADER AUTOSTEER

- Farmer was able to spray 80 additional acres today and run over less corn due to reduced operator fatigue and accuracy

RAVEN OMNIDRIVE

- While you are at school functions during harvest, your Dad was able to continue harvesting without hiring an additional employee to drive the grain cart

**PRECISION PLANTING
HYDRAULIC
DOWNFORCE**

- Increased corn yield by 4.7 bushels per acre by achieving uniform plant emergence in a no-till field with varying areas of compaction

**PRECISION PLANTING
ROWFLOW PLANTER
CONTROL**

- Saved 2 bags of seed corn by not double planting point rows and end rows in odd shaped (not square) fields
- Increased yield by 2 bushels per acre on end rows and point rows by not having too high of plant population due to planter overlap

**AG LEADER
DIRECTCOMMAND SPRAYER
SECTION CONTROL**

- Reduced herbicide cost in contour rowed field by not double applying herbicide on point rows and around terraces
- Reduce the potential of crop damage from herbicides and fertilizer by not overlapping sprayer patterns

**JOHN DEERE
SEE & SPRAY**

- Reduced chemical application by 40% by spraying specific weeds only and not broadcasting the entire field

**TARANIS
DRONE SCOUTING**

- After a weather event, through the use of artificial intelligence, you were able to see the plant population across the entire field, export a zone map of the poor areas, and variable rate plant only the areas that needed replanting
- Through images and imagery, you are able to tell what parts of your field's plant health is trending negatively, so you know where to direct your scouting

**RANTIZO
DRONE SPRAYING**

- You were able to apply herbicide to a small patch of weeds in the middle of your soybean field without driving over any crop, limiting yield loss

Disclaimer: These are examples only and not actual savings or yield increases.

Name: _____

MATCH

Match the ag technology to the efficiency by writing the correct letter on the line.

- | | |
|---|---|
| 1. _____ Taranis Drone Scouting | A) Reduced operator fatigue and increases accuracy by automatically steering |
| 2. _____ Variable Rate Seeding | B) Changes speed of pivot to help utilize water better |
| 3. _____ John Deere See & Spray | C) Reduces chemical application by only spraying weeds and not entire field |
| 4. _____ Ag Leader AutoSteer | D) Tracks plant's available water and root depth |
| 5. _____ Raven OmniDrive | E) Aids in uniform plant emergence |
| 6. _____ Precision Planting Hydraulic Downforce | F) Allows for herbicide application without having to drive over any crops |
| 7. _____ Variable Rate Irrigation | G) Increases bushels by applying different amount of nitrogen based on field needs in different areas |
| 8. _____ Precision Planting RowFlow Planter Control | H) Stops the double applying of herbicide on point rows and around terraces |
| 9. _____ Variable Rate Nitrogen | I) Permits you to scout entire fields to see how each zone is performing without having to walk through field |
| 10. _____ Ag Leader DirectCommand Sprayer Section Control | J) Prevents the double planting of point rows and end rows in odd shaped (not square) fields |
| 11. _____ Rantizo Drone Spraying | K) Driver-less grain cart allowing for one less employee at harvest |
| 12. _____ AquaSystems Moisture Probe | L) Increases bushels by planting different amount of seed based on field potential in different areas |



Name: _____

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