Overview of Precision Ag Applications for EQIP

2009 EQIP Precision Agriculture Incentive Training
January 13 – 16, 2009

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Alabama Cooperative Extension System
EQIP Precision Ag Incentive

• Why Precision Ag for EQIP?
  – Site-specific management
  – Target inputs
  – Increase accuracy & efficiency of applications
  – Improved energy & fuel efficiency
EQIP Precision Ag Incentive

• Benefits
  – Water quality
    • Surface runoff
    • Leaching
  – Soil quality
Results from Cotton Farming Magazine Poll

What would be your first choice of equipment/tools to invest in next year?

- Tractor: 10%
- Harvest Equipment: 19%
- Irrigation Equipment: 29%
- Spray Equipment: 13%
- Precision Ag Tools: 29%
EQIP Precision Ag Incentive

• Eligibility
  – Cropland producing annual crops
  – Specified counties
  – Acreage maximum
  – Producers who are:
    • Not currently implementing practices outlined in plan
    • Willing to advance current practices to a higher level as outlined in plan
Nutrient Management
Nutrient Management

• Variable-Rate Applications of Nutrients (fertilizer or lime)

• Applications must be according to recommendations based on:
  – Grid sampling OR
  – Zone sampling
Nutrient Management

• Grid soil sampling
  – 2.5 acre grid size or smaller
  – Grid and samples can be determined by farmer, consultant or commercial operator

2.5 acre grid 1 acre grid
Nutrient Management

• Zone soil sampling
  – 20-acre zone size or smaller
  – Zones based on:
    • Soil survey data
    • Yield data
    • Soil electrical conductivity (EC) data
    • Aerial or satellite images
    • Combination of any of the above
Nutrient Management

• Practice Levels
  • 1 represents lowest level (entry level)
  • 4 represents highest level attainable

As levels progress, the accuracy, repeatability and efficiency of the system increases.
Nutrient Management

• Grower Eligibility
  • Not currently applying practices at minimum levels
  • Applying practices but willing to progress to the next level
Nutrient Management

• **Level #1**
  - Base requirement
  - VRA has been made based on grid or zone sampling criteria
  - Must use GPS enabled equipment for applications
Nutrient Management

• **Level #2**
  – Base requirement
  – VRA has been made based on grid or zone sampling criteria
  – Must use GPS enabled equipment for applications
    – **Must use vehicle equipped with GPS enabled guidance**
  – GPS guidance utilizes **free correction service** i.e. WAAS, SF1, etc.
Nutrient Management

• **Level #3**
  – Base requirement
  – VRA has been made based on grid or zone sampling criteria
  – Must use GPS enabled equipment for applications
  – Must use vehicle equipped with GPS enabled guidance
  – GPS guidance utilizing **paid subscription service** i.e. OmniSTAR HP/XP, SF2, etc.
Nutrient Management

• **Level #4**
  – Base requirement
  – VRA has been made based on grid or zone sampling criteria
  – Must use GPS enabled equipment for applications
  – Must use vehicle equipped with GPS enabled guidance
  – GPS guidance utilizing RTK correction service with $\pm 1$ inch accuracy and year-to-year repeatability
Example

A grower VR applies fertilizer based on grid sampling and a vehicle equipped with a foam marker system.

To be eligible he must progress to using a vehicle equipped with GPS-enabled guidance.
Nutrient Management

• Certification Requirements
  – Completed first year of contract unless data from previous two years is available
  – Nutrient Management Plan defined
  – Precision ag equipment for GPS-enabled guidance must be installed on predominant application equipment.
Nutrient Management

• Certification Requirements
  – Soil sampling maps (grid or zone)
  – Soil test recommendations
  – As-applied nutrient maps
  – Hardcopy or electronic (.shp, .jpg, .rtf.)
Certification Examples
Grid Soil Sampling Map

Field : Nematode Project
Year : 2007
Operation : Generic
Crop / Product : NO PRODUCT
Op. Instance : Instance - 1
Area : 137.82 ac
Length : 81,442 ft
Count : 57
Soil Test Map

Field: Nematode Project
Year: 2007
Area: 137.82 ac
Length: 81,442 ft
Operation - Name: Generic

Soil K
- 160.00 - 217.00
- 120.00 - 160.00
- 60.00 - 120.00
- 0.00 - 60.00
Fertilizer Application Map

Field: Nematode Project
Year: 2007
Operation: Fertilizing Prescription (Dry)
Crop / Product: K
Area: 137.82 ac
Total Amount: 2,780.2 lb
Average Rate: 20.17 lb/ac
Minimum Rate: 0.00 lb/ac

Target Rate (Mass)
(lb/ac)

- 60.00 (7.31 ac)
- 50.00 (2.71 ac)
- 40.00 (67.64 ac)
- 0.00 (84.91 ac)
Fertilizer Application Map

Field: Nematode Project
Year: 2007
Crop/Product: K
Area: 137.82 ac
Total Amount: 2,780.2 lb
Average Rate: 20.17 lb/ac
Minimum Rate: 0.00 lb/ac
Maximum Rate: 60.00 lb/ac

Target Rate (Mass) (lb/ac)
- 60.00 (7.59 ac)
- 50.00 (2.92 ac)
- 40.00 (72.18 ac)
- 0.00 (88.81 ac)
Pest Management
Pest Management

• Practice Levels
  • 1 represents lowest level (entry level)
  • 4 represents highest level attainable

As levels progress, the accuracy, repeatability and efficiency of the system increases
Pest Management

• Grower Eligibility
  • Not currently applying practices at minimum levels
  • Applying practices but willing to progress to the next level
Pest Management

• **Level #1**
  – Pesticide application has been made with vehicle equipped with GPS-enabled guidance
  – GPS guidance utilizes free correction service i.e. WAAS, SF1, etc.
Pest Management

• Level #2
  – Pesticide application has been made with vehicle equipped with GPS-enabled guidance
  – GPS guidance utilizes free correction service i.e. WAAS, SF1, etc.
  – Application is made with vehicle using swath control technology (boom-section or nozzle section control)
Pest Management

• **Level #3**
  
  – Pesticide application has been made with vehicle equipped with GPS-enabled guidance
  
  – GPS guidance utilizes correction service with a minimum accuracy of \(+/-\ 4\) inches i.e. HP/XP, SF2, RTK

**Swath control is not required at level 3**
Pest Management

• Level #4
  – Pesticide application has been made with vehicle equipped with GPS-enabled guidance
  – GPS guidance utilizes correction service with a minimum accuracy of +\- 4 inches i.e. HP/XP, SF2, RTK
  – Application is made with vehicle using swath control technology (boom-section or nozzle section control)
Example

A grower applies a pesticide using a vehicle equipped with GPS-enabled guidance (level 1).

To be eligible for the program she must add swath control technology (level 2).
Pest Management

• Certification Requirements
  – Precision ag equipment for GPS-enabled guidance must be installed on predominant application equipment
  – Pest Management Plan
Pest Management

• Certification Requirements
  – Pesticide application records
  – When available geo-referenced as-applied maps (hardcopy or electronic form)
    • Field name/acreage
    • Legend depicting rates applied
    • Date applied
Spraying Prescription Map

Target Rate (Liquid)
(gal(US)/ac)

- 39.00 (14.68 ac)
- 34.02 (21.48 ac)
- 28.00 (7.22 ac)

Field: BAL PE
Year: 2006
Operation: Spraying Prescription
Crop/Product: NITRATE 32%
Op. Instance: Instance - 1
Area: 43.36 ac
Total Amount: 1,504.5 gal(US)
Avg. Rate: 34.70 gal(US)/ac
As-Applied Spray Map

Rate Applied (Liquid vol) (gal(US)/ac)
- 38.79 - 66.44 (10.512 ac)
- 33.94 - 38.79 (4.498 ac)
- 33.93 - 33.94 (4.462 ac)
- 33.92 - 33.93 (3.733 ac)
- 33.90 - 33.92 (4.808 ac)
- 30.91 - 33.90 (4.323 ac)
- 26.45 - 30.91 (4.536 ac)

Field: BAL PE
Year: 2006
Operation: Spraying
Crop/Product: PRODUCT 1
Op. Instance: Spraying - 1
Area: 38.56 ac
Est. Amount: 1,295.9 gal(US)
Avg. Rate: 35.17 gal(US)/ac
Start Date: 4/29/2006
End Date: 5/2/2006
Avg. Productivity: 15.87 ac/hr

Precision Ag Team
Prescription  As-Applied
### Event Details

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### Environmental Conditions

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Summary

• Nutrient Management (590)
• Pest Management (595)
• As practice levels progress, the accuracy, repeatability and efficiency of the system increases
• Growers already implementing practices may be eligible to participate in EQIP plan by going to the next level of the program
• Certification records include as-applied data, soil tests, and sampling maps