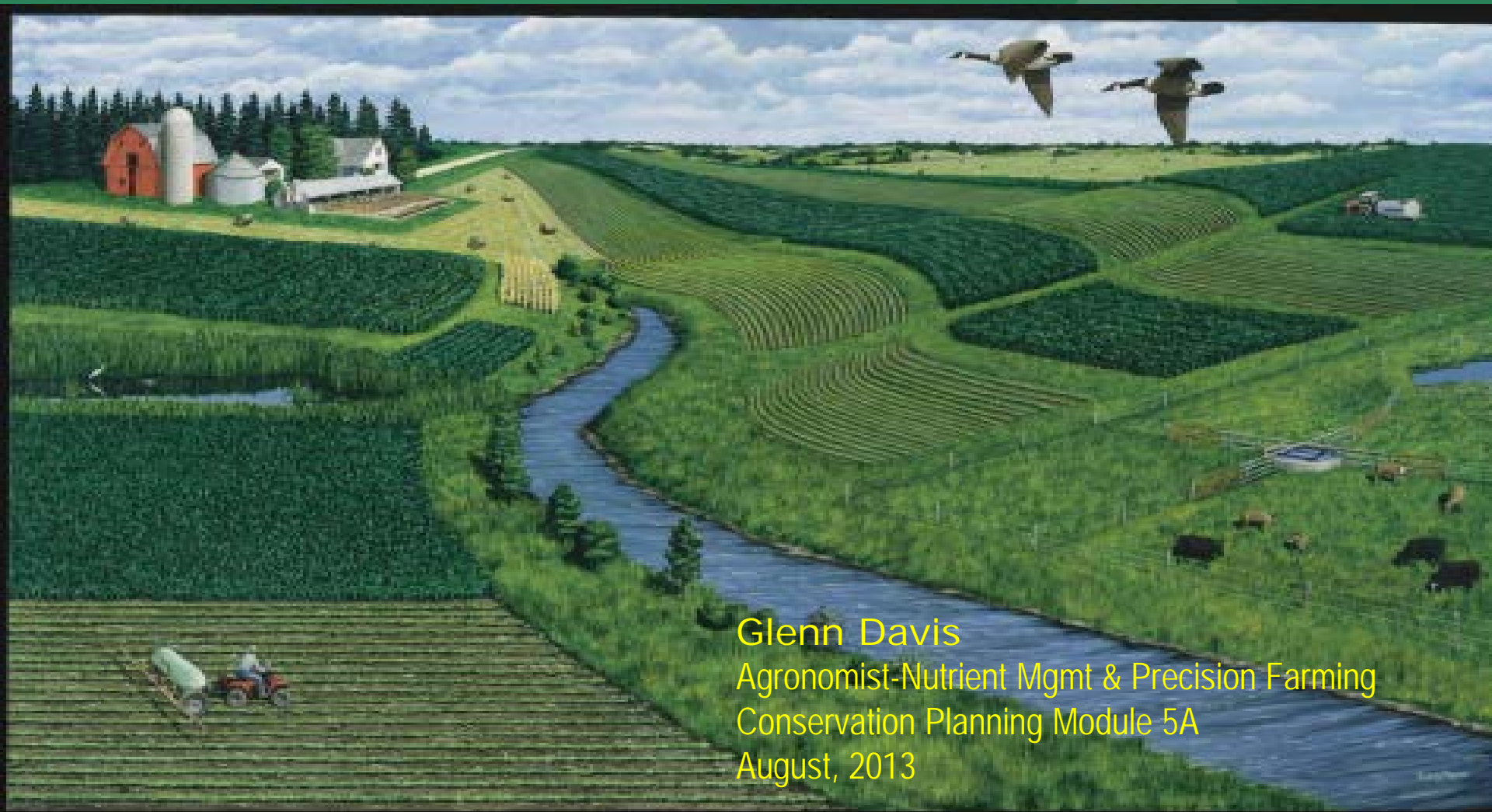


# Nutrient & Pest Management



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Conservation Planning Module 5A  
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# Presentation Format

- Conservation practice resource concerns addressed
- Minimum planning requirements
- Certification requirements and procedures
- Planning tools and Plan format

# SECTION 1: Nutrient Management



# SECTION 1: Nutrient Management

- Definition

- Managing the amount (rate), source, placement (method of application), and timing of plant nutrients and soil amendments.
- “4Rs” of nutrient management
  - Right Amount
  - Right Source
  - Right Time
  - Right Place

# Resource Concerns-

## NUTRIENT MANAGEMENT

- **Primary:**
  - Water quality
  - Plant condition
- **Secondary**
  - Air quality
  - Soil condition



# Nutrient Management

- Nutrients from inorganic sources (“fertilizer”)
- Guaranteed analysis
- Usually “concentrated”
- Form is flexible
- Placement is flexible



# Nutrient Management

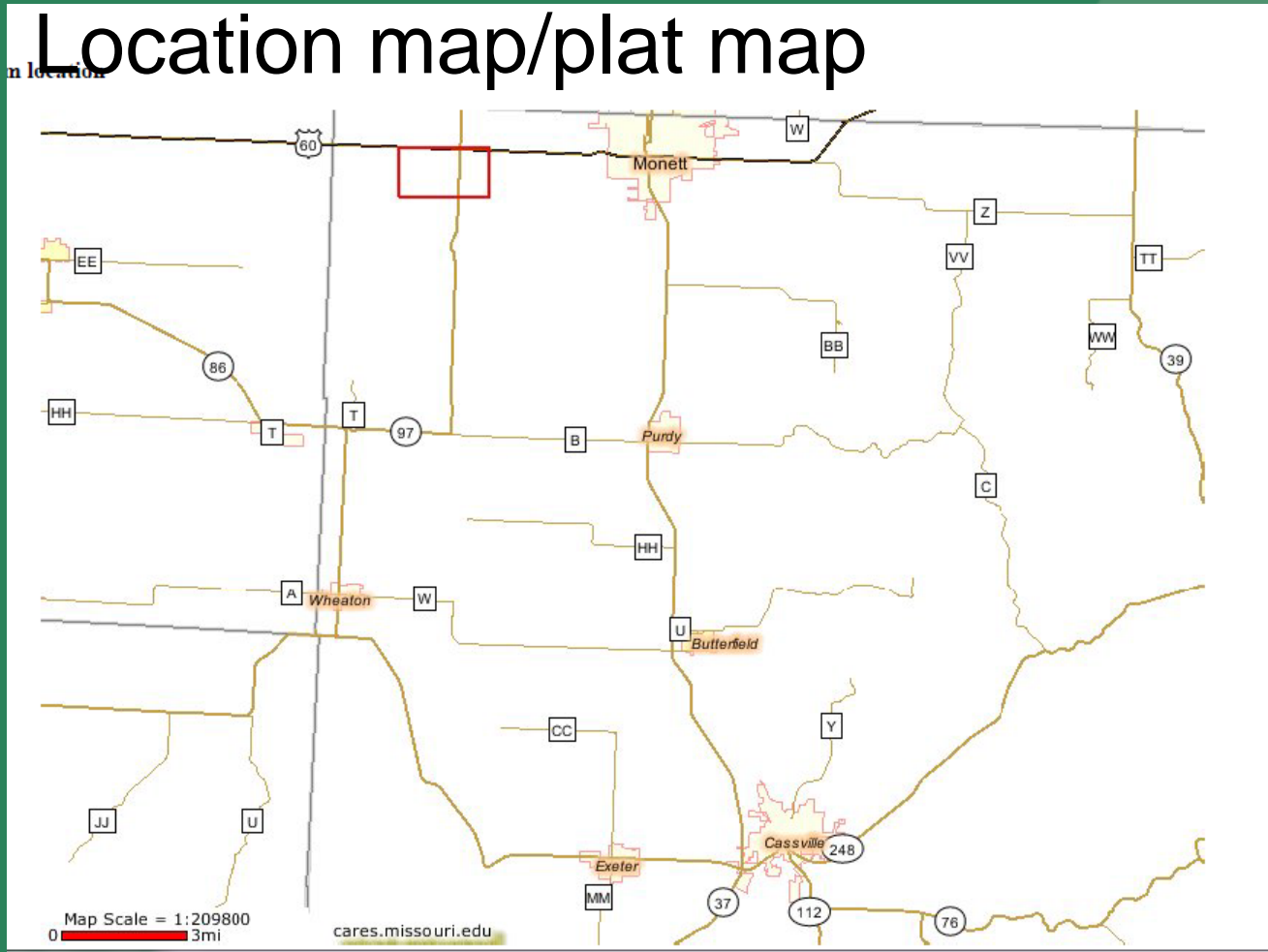
- Nutrients from organic sources (manure)
- Nutrient content is uncertain

- Needs at least an annual analysis
- Best if done when applied



# Nutrient Management Plan

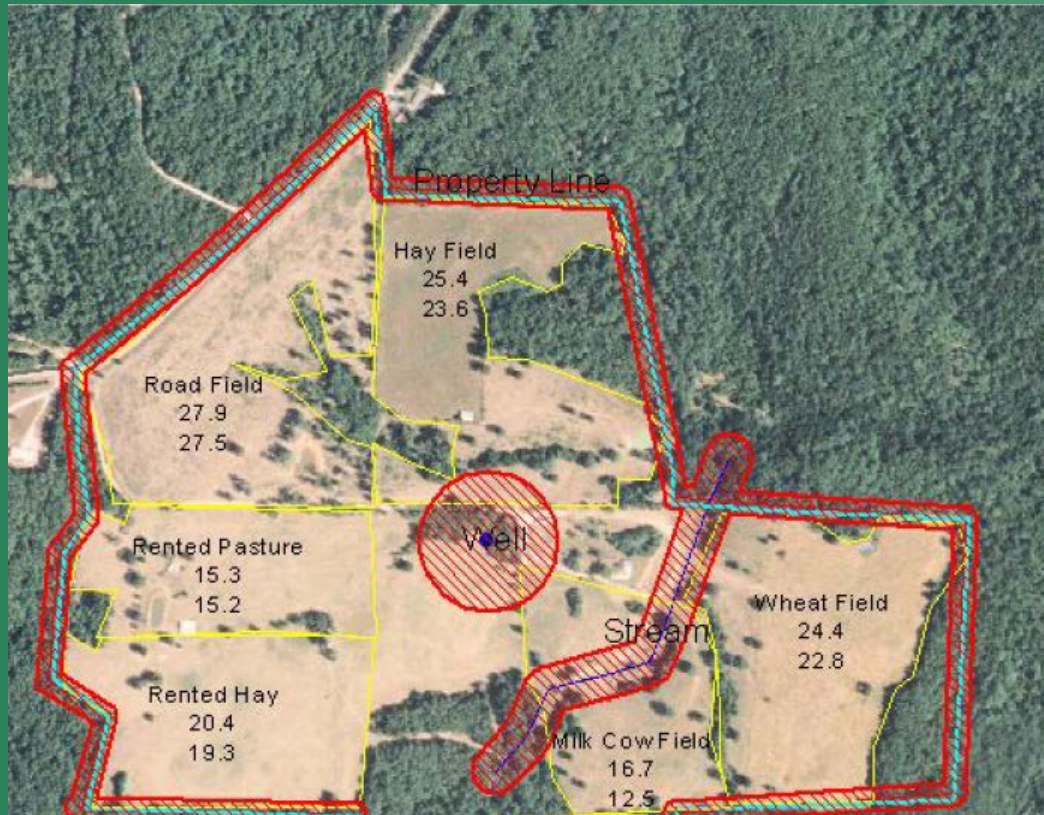
- Essential items (1)
- Location map/plat map





# Nutrient Management Plan

- Essential items (2)
  - Map showing field boundaries and any application setbacks



# Nutrient Management Plan

- Essential items (3)
  - Soils map

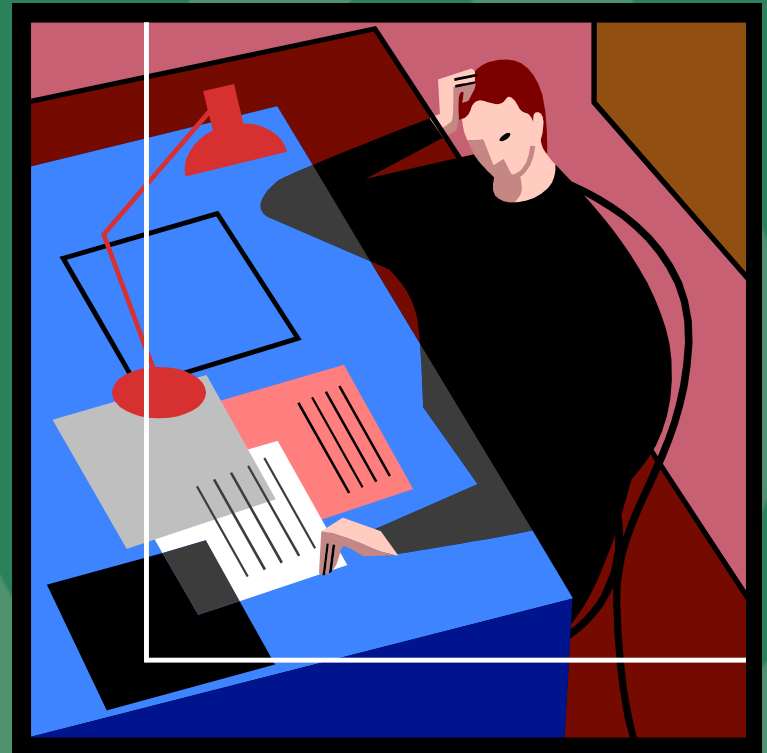


# Nutrient Management Plan

- Essential items (4)
  - A four-year budget for NPK
    - Nutrients applied minus Nutrients utilized = Nutrients remaining in soil
    - Usually apply nutrients according to a recommendation
    - For USDA programs in Missouri, must use University of Missouri-Columbia Extension recs

# Nutrient Management

- A four-year budget for NPK
  - This is hard to do by hand
  - Utilize computer tools



## Manure Management Planner (MMP)

Manure Management Planner - SNMP.mmp

General | Fields | Assessment | Soil Tests | Crops | Storage | Animals | Rations | Analysis | Equipment | Nutrient Mgmt

Plan Month:	Oct 2012	Nov 2012	Dec 2012	Jan 2013	Feb 2013	Mar 2013	Apr 2013
» Pit	0.0	5.0	0.0	5.0	0.0	5.0	0.0
» Wheat Field	2.5 / 22.8				F		
Hay Field					F		
Road Field						F	
Rented Pasture			5 / 15.2		10 / 15.2	F	15 / 15.2
Rented Hay						F	

What Is Application's Manure Source?	Application Equipment	Days To Incorp.	Rate (/Acre) <input type="button" value="Calc..."/>	Loads	Amount Applied	Area Covered (Acres)	Apply At Or For	U <sub>i</sub>
» <input type="text"/>								

New | Open | Reopen | Close | Save | Save As | Tools | ? Help | About | Exit

Area of field that has been manured after this month's applications (bottom grid) and whether fertilized (press F2 to apply fertilizer).

# Comprehensive Nutrient Management Plan (CNMP)

- A conservation plan for animal feeding operations
- Engineering and agronomic issues
- Addresses the production area (animals, manure storage)
- Addresses land application area
- Complication—Regulatory



# Comprehensive Nutrient Management Plan (CNMP)

- WAY too complicated to get into here
- Attend MU's course

## Demo

- Mapping
- Manure Management Planner (MMP) for a fertilizer-only operation (no manure)
- Export to a report generator website



# Certification

- Three options in Missouri
  - Organizations—e.g., Certified Crop Advisor
  - Education-BS in agronomy or allied plant nutrient field
  - Experience-Three years within the last five in nutrient management planning

# Certification

- All options require:
  - Knowledge of tools such as RUSLE2, WEPS, WEQ, P-index, Leaching Index
  - NRCS course-Modules 1-7 of *Nutrient & Pest Management Considerations in Conservation Planning*. Module 7 is a proctored test administered by NRCS State Office staff.
  - Two customer references where technical service has been provided. A completed nutrient management can be substituted.

# Certification

- Maintaining certification
  - Eight hours/yr of Continuing Education
  - Provide current nutrient management materials provided to landowner once every three years.
  - Maintain technical proficiency. All assistance is subject to random review.
  - Additional formal training as required by reviewing staff

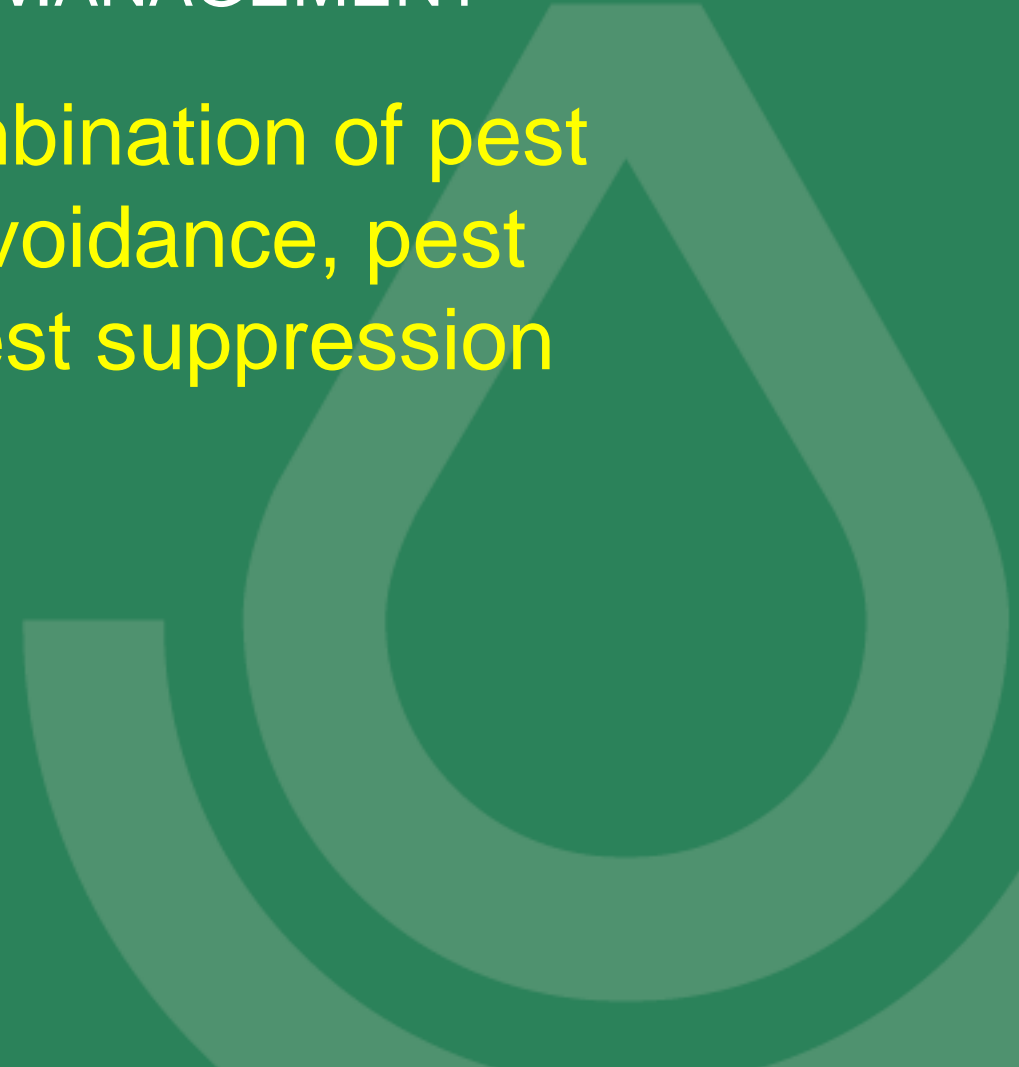
# SECTION 2: Integrated Pest Management



## Definition:

### INTEGRATED PEST MANAGEMENT

A site-specific combination of pest prevention, pest avoidance, pest monitoring, and pest suppression strategies.



# Resource Concerns-

## INTEGRATED PEST MANAGEMENT

- **Primary:**
  - Water quality
  - Plant condition
  - Animal health
- **Secondary**
  - Air quality
  - Soil condition



# Integrated Pest Management (IPM)

- An IPM conservation plan
  - Sustainable management of pests
  - Minimizes risk to
    - Human health
    - Beneficial/non-target organisms
    - “The Environment”

# Integrated Pest Management (IPM)

- A decision-making process
- Determines management solution that is
  - Appropriate
  - Cost effective



## SECTION 2: Integrated Pest Management (IPM)

- Establishes pest tolerance levels
- Establishes monitoring protocols
- Develop an effective, site-specific and low-risk strategy to manage the pest

# Integrated Pest Management (IPM)

- Possible tools/techniques:
  - Chemical tools



# Integrated Pest Management (IPM)

- Possible tools/techniques:
  - Biological control
    - Conservation (of natural enemies)
      - Lacewings, lady beetles
    - Classical control-importing and releasing natural enemies to control an introduced (“exotic”) pest
      - Often used when an introduced pest is not controlled by natural enemies
      - European corn borer controlled by *Trichogramma ostriniae* (Chinese parasitic wasp)

# Integrated Pest Management (IPM)

- Possible tools/techniques (2):
  - Biological control
    - Long-lasting, inexpensive
    - Best against exotic pests
    - Not always effective; sometimes due to ineffective introduction, poor adaptation to new environment, or poor synchrony of life cycle between enemy species and pest

# Integrated Pest Management (IPM)

- Possible tools/techniques (3):
  - Inoculative release of natural enemies
  - Habitat manipulation-refuge, food source

# Integrated Pest Management (IPM)

- **NRCS Responsibility**
  - Meet NRCS quality criteria for soil erosion, water quality, air quality, plant quality
  - Comply with federal, state, tribal, local laws, regulation, and permit requirements
  - Address operator objectives

# Integrated Pest Management (IPM)

- NRCS Responsibility (2)
  - NRCS *does not* make chemical recs or change chemical labels
  - NRCS *does* provide guidance and mitigation strategies for existing recs
  - Protect resources

# Integrated Pest Management (IPM)

- Possible tools/techniques:
  - Chemical tools
  - Biological control
  - Habitat manipulation
  - Modified cultural practices
  - Resistant varieties



# IPM Plan Requirements

- Identify target pest(s)
- Identify control methods
- Risk assessment
- Identify mitigation strategies
- Determine effectiveness

# IPM Plan Requirements (2)

- Use a Job Sheet – JS-AGRON-31
  - Crop Management
    - Crops
    - Tillage type and timing
    - Residue
  - Identify pest(s)
  - List control method(s)

# IPM Plan Requirements (3)

- Use a



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