1980’s
Recognized need for:
Producer Focused, Water Quality Programming
Jerry Carpenter, 1st MU State WQ Specialist
Natural Resources
Environmental Team

MU Agronomists & Ag Engineering staff working with MO DNR

Developed and Implemented State-wide Programming
• Secondary Containment Systems
  On-farm fertilizer & pesticide storage

• Residential Waste Management
  Home lagoons & septic systems

• Land Application of Bio-Solids
  Municipal treatment facility waste
• On-Farm Fuel Storage Spill Management Plans
  Producer self-assessment & plan development

• Pesticide Movement
  Best Management Practices Survey w/ Training
2000’s

On-Farm Research

• Fertilizer placement in row-crops
  Maintain yield while reducing fertilizer mobilization

• Cover Crops
  Nutrient sequestering & soil health
Soil Health

Soil Health Assessment Center

Analysis of long-term cover crop plots revealed need to supplement soil characterization lab.

MU SHAC is 1 of 2 public Soil Health Centers in the nation.

Quantitative—Measure indicators of Soil Functions
  Physical
  Chemical
  Biological

Soil Specific—Compare soil indicator values to
  Native benchmark soils
  Fields with similar soils

Prescriptive—Identify limiting soil attributes

Evaluative—Compile database
  Evaluate progress
  Evaluate management effectiveness
Soil Health Sampling

- Joint NRCS / MU Extension Effort
- Soil & Water Conservation Districts managing cover crop contracts
- MO DNR providing sample analysis cost-share
- Highest statewide sampling density in counties of Lincoln, Warren and Montgomery
EC Region MU Extension
Pesticide Use & Water Quality Survey
2014-2017

Preliminary Results Survey Study of Producers
Thoughts, Attitudes & Actions
2014-2017

Rich Hoormann, MU Extension Horticulture Specialist
Matt Herring, MU Extension Agronomy-Natural Resources Specialist
Rusty Lee, MU Extension Agronomy Specialist
Distribution of Farmers Surveyed by Farm Size (2015-16)

(226 farmers reporting acreage out of 238)
Land farmed by Reporting Producers 2015-16

Herbicide Acreage Reported

<table>
<thead>
<tr>
<th></th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmed</td>
<td>190,089</td>
</tr>
<tr>
<td>Herbicide Application</td>
<td>176,565</td>
</tr>
</tbody>
</table>
Percentage Farmers Reporting Herbicide Application (2015-16)

(238 farmers Surveyed)

Farmers Reporting Herbicide Activity by Percentage

- Herbicide Application: 91.6%
- Non Herbicide Application: 3.4%
- Response: 5%

Cover Crops Integration
Building Resilient Crop Systems

University of Missouri Extension
Knowledge about... Watershed characteristics that may make label recommendation inadequate for protecting water quality

Knowledge of Watershed Characteristics

- Expert
  - Pre-test: 2.5
  - Post-test: 3.7
- No Knowledge
  - Pre-test: 2.5
Knowledge about... Riparian Forest Buffers

Knowledge of Riparian Forest Buffers

<table>
<thead>
<tr>
<th></th>
<th>Expert</th>
<th>No Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>2.3</td>
<td></td>
</tr>
<tr>
<td>Post-test</td>
<td>3.1</td>
<td></td>
</tr>
</tbody>
</table>
Knowledge about... Properties of herbicides for protecting water quality.

![Bar chart showing knowledge about BMP’s for herbicides before and after training.](chart.png)

**Pre-test**
- Expert: 2.6
- No Knowledge: 2.5

**Post-test**
- Expert: 3.4
- No Knowledge: 3.4
Knowledge about... Importance to keep pesticides out of streams and lakes.

![Bar chart showing pre-test and post-test scores for pesticide and water quality knowledge]

- **Pre-test**: 3.6
- **Post-test**: 4.0
Farmers Reporting Intent to Increase Pesticide Runoff BMPs within the Next 12 Months (2015-16) (204 responding out of 238 Surveyed)
Farmers Reporting Intent to Consider Pesticide Alternatives to Atrazine within the Next 12 Months (2015-16)

(204 responding out of 238 Surveyed)
Farmers Reporting Intent to Use Field Borders/Filter Strips to Control Runoff in the Next 12 Months (2015-16)

(205 responding out of 238 Surveyed)
Farmers Reporting Intent to Install Riparian Areas in the Next 12 Months (2015-16)

(202 responding out of 238 Surveyed)

- Won't Change: 22.3%
- Might Change: 43.1%
- Will Change: 12.9%
- Already Doing: 21.8%
Farmers Reporting Intent to Plant Cover Crops in the Next 12 Months (2015-16)

(147 responding out of 192 Surveyed in 2016) *

*Only 2016 survey data used, as cover crop question introduced to survey in 2016 (192 farmers surveyed)
Farmers Reporting Intent to Plant Cover Crops in the Next 12 Months (2015-16)

(147 responding out of 192 Surveyed in 2016)*

Covers

- 44.9% either doing or intending to plant covers in next 12 months
- 29.9%
- 12.2%
- 15%
- 42.9%

*Only 2016 survey data used, as cover crop question introduced to survey in 2016 (192 farmers surveyed)