Title: Nutrient Stewardship for Cleaner Water

1. Describe how the program was implemented across the state of Ohio in 2015.

• **Who:** Nutrient stewardship was taught to 5658 producers and agriculture business persons who apply fertilizer with a guaranteed analysis to more than 50 acres of agricultural production grown primarily for sale received the Fertilizer Applicator Certification Training (FACT) by 50 Agricultural and Natural Resources educators.

  Attendees to the Farm Science Review attended the display in the Firebaugh building and participated in a panel discussion regarding nutrient management.

  25% of OSU Extension Agriculture and Natural Resources Educators have conducted on-farm and field trials of best management practices of application method, timing and nutrient rates. Another 8% will be conducting on-farm research in 2016.

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• **How:** Approximately 100 meetings where Nutrient Stewardship was taught were held throughout the state in either a county or regional meeting.

  Producers and agriculture business persons completed nutrient stewardship training in FACT two or three hour trainings, field days, seminars, displays and soil and nutrient management series.

  Other events where the public could learn about nutrient stewardship included the Farm Science Review, Chamber AG Days and Conservation Tillage Conference.

• **How many:** In 2015, 5658 people received FACT certification. Nearly 900 persons attended the Conservation Tillage Conference where many of the topics address soil and nutrient management. About 120,000 participated in Farm Science Review where activities regarding Nutrient Stewardship were featured.

• **How long:** Nutrient Stewardship education was received in casual observation, two and three hour meetings, day long field events, 2 day conferences and season long On Farm research projects.
• **Other:** Numerous articles and radio spots featured nutrient stewardship education along with direct testimony to legislators regarding the efforts of OSU Extension in being part of the water quality solution.

*Signature Program leaders were given the option to upload supporting documentation for this criteria (see Appendix A).* NOTE: Please refer to Appendix A to see additional information about program implementation.

**2a. Describe the short-term outcomes of the program (changes in awareness, knowledge, attitude, skills, aspiration).**

Educators report that 95% of OSU Extension clientele have adopted soil testing and 68% follow Tri-State fertilizer recommendations for agronomic and other crops and are using organic and inorganic nutrient sources for optimal crop production.

Fertilizer Applicator Certification Training by Extension Educators is emphasizing the optimization of the efficiency of fertilizer use by incorporating the 4R concept: the Right fertilizer source, at the Right rate, at the Right time and in the Right place.

Agriculture and Natural Resources Educators and Program Coordinators from across the state participated in an intense educational inservice to provide training and consultation to their clientele.

Survey results from FACT meetings found the following:
- 76% agreed or strongly agreed that farm field phosphorous is a significant problem to our water resources (streams, rivers, lakes).
- 51% agreed or strongly agreed that they would change their nutrient management practices as a result of the meeting.
- 59% agreed or strongly agreed that they would use an economic based nitrogen calculator to determine their nitrogen rate.

Fields with high nutrient loss risk have been identified. The implementation of appropriate cost effective Best Management Practices on these fields will be studied for effectiveness of reduction in nutrient loss.

**2b. Describe the medium-term outcomes of the program (changes in behavior or practice).**

There have been many changes in behavior and practice as a result of the nutrient management work being done by OSU Extension. Producers are using the information they receive from educators and field specialist to make better soil and nutrient management decisions.

Livestock producers in Western Ohio are now using livestock manure as a nutrient source for top dressing wheat and side-dressing corn. They know that applying the manure to a growing crop will be more beneficial to them and is environmentally sound.

Producers are using less nitrogen and phosphorous as they have been taught the correct way to interpret soil reports and to use economic calculators for determining their nutrient needs.
2c. Describe the long-term outcomes of the program (changes in conditions or policy).

The long-term goals of this signature program have not been met but our goals are to:

1. Reduce the incidence of Microcystis, a cyanobacterium—more commonly called blue-green alga—blooms in Lake Erie.
2. Reducing phosphorus loading in waterways.
3. Improve water quality by helping growers use adaptive management to lessen phosphorus and nitrogen use increasing crop yields and boosting farm profits.
4. Offering training for producers and commercial fertilizer applicators on: the current state of Ohio waters, soils and soil testing, best management practices for phosphorous and nitrogen use.

*Signature Program leaders were given the option to upload supporting documentation for this criteria (see Appendix B). NOTE: Appendix B is blank for this annual report.

3. Describe the extent to which the program elevates the public's knowledge of OSUE.

OSU Extension is quickly becoming known as the source for water quality and soil and nutrient management research and education. Within the legislative process Educators around the state have been consulted by their legislators regarding on farm research and nutrient management.

It is projected that nearly 15,000 persons will complete the Fertilizer Applicator Certificate Training program. The participants will complete re-certification training every three years to maintain the certificate. This exposure to researched based, quality education will demonstrate the value of Ohio State University Extension.

Intentional branding of all Fertilizer Applicator Certificate Training curriculum and materials including PowerPoint's have been branded with the appropriate university, college, Extension and nutrient stewardship logo to focus the training on unbiased, research based information.

*Signature Program leaders were given the option to upload supporting documentation for this criteria (see Appendix C). NOTE: Appendix C is blank for this annual report.

4. Describe the extent to which proposed program marketing, communication, implementation and evaluation methods and strategies were followed.

The communications team for the College of Food, Agricultural and Environmental Sciences has been developing marketing tools to promote the Nutrient Stewardship for Cleaner Water Program.

Currently there are branded templates for yard signs, ink pens, banners, flyers, brochures and PowerPoint's available. Be Part of the Solution window clings, manuals and ink pens have been distributed to Fertilizer Applicator Certification Training completers and to others to further promote the program, college and university.

Evaluations are being completed for each meeting being held and the information tabulated within a spreadsheet environment.

*Signature Program leaders were given the option to upload supporting documentation for this criteria (see Appendix D). NOTE: Appendix D is blank for this annual report.
*Signature Program leaders were given the option to upload supporting documentation to supplement this annual report (see Appendix E). NOTE: Appendix E is blank for this annual report.
APPENDIX A:
PROGRAM IMPLEMENTATION
## Fertilizer Certification Training Evaluation Summary

Two and Three Hour Meetings, December 2014 – April 2015

Total Evaluations Collected: 2074 (1153-3hr / 921-2hr)
Participation rate approximately 33%
Questions 3-5, 7-9, 12 not included in two-hour survey

2. How many acres do you farm or advise?

<table>
<thead>
<tr>
<th></th>
<th>Under 250</th>
<th>251-500</th>
<th>501-1000</th>
<th>1001-2500</th>
<th>2501-5000</th>
<th>&gt;5000 A</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Farmers n=1826</td>
<td>544 (30%)</td>
<td>419 (22%)</td>
<td>367 (20%)</td>
<td>350 (19%)</td>
<td>100 (6%)</td>
<td>22 (1%)</td>
<td>24 (1%)</td>
</tr>
<tr>
<td>b. Ag Bus. n=236</td>
<td>33 (2%)</td>
<td>27 (1%)</td>
<td>40 (2%)</td>
<td>33 (2%)</td>
<td>11 (&lt;1%)</td>
<td>22 (1%)</td>
<td>69 (3%)</td>
</tr>
<tr>
<td></td>
<td>18-30</td>
<td>31-40</td>
<td>41-50</td>
<td>51-60</td>
<td>60+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Age Group n=956</td>
<td>128 (13%)</td>
<td>153 (16%)</td>
<td>154 (16%)</td>
<td>263 (28%)</td>
<td>258 (27%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High School</td>
<td>Assoc.</td>
<td>Bachelors</td>
<td>Masters+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Education n=914</td>
<td>521 (57%)</td>
<td>161 (18%)</td>
<td>189 (21%)</td>
<td>43 (5%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Attended OSUE programs n=930</td>
<td>743 (80%)</td>
<td>187 (20%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on your experience at today’s meeting, please rate your level of agreement with each of the following statements:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Farm field P loss is a significant problem to our water resources n=2010</td>
<td>29 (1%)</td>
<td>72 (4%)</td>
<td>386 (19%)</td>
<td>1057 (53%)</td>
<td>455 (23%)</td>
<td>11 (&lt;1%)</td>
</tr>
<tr>
<td>7. I have improved my knowledge about nutrient management n=975</td>
<td>5 (&lt;1%)</td>
<td>5 (&lt;1%)</td>
<td>66 (7%)</td>
<td>625 (64%)</td>
<td>272 (28%)</td>
<td>2 (&lt;1%)</td>
</tr>
<tr>
<td>8. The educational materials shared were appropriate n=968</td>
<td>4 (&lt;1%)</td>
<td>7 (&lt;1%)</td>
<td>58 (6%)</td>
<td>614 (63%)</td>
<td>283 (29%)</td>
<td>2 (&lt;1%)</td>
</tr>
<tr>
<td>9. The training method used was appropriate n=966</td>
<td>5 (&lt;1%)</td>
<td>9 (1%)</td>
<td>74 (8%)</td>
<td>606 (63%)</td>
<td>271 (28%)</td>
<td>1 (&lt;1%)</td>
</tr>
<tr>
<td>10. Current Tri-State Fertility Recommendations for P will limit my corn and soybean yields n=1997</td>
<td>115 (6%)</td>
<td>484 (24%)</td>
<td>785 (39%)</td>
<td>379 (19%)</td>
<td>163 (8%)</td>
<td>71 (4%)</td>
</tr>
<tr>
<td>11. I will change my nutrient management practices as a result of this meeting n=2015</td>
<td>26 (1%)</td>
<td>135 (7%)</td>
<td>794 (39%)</td>
<td>819 (41%)</td>
<td>191 (10%)</td>
<td>50 (2%)</td>
</tr>
<tr>
<td>12. When setting a corn nitrogen rate, I will utilize an economic based nitrogen calculator n=1109</td>
<td>9 (1%)</td>
<td>50 (4%)</td>
<td>340 (31%)</td>
<td>514 (46%)</td>
<td>141 (13%)</td>
<td>55 (5%)</td>
</tr>
</tbody>
</table>
13. Describe your soil testing
n= 1845

<table>
<thead>
<tr>
<th>Sample Size</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. More than 25 acres/sample</td>
<td>165 (9%)</td>
</tr>
<tr>
<td>2. Less than 25 acres/sample</td>
<td>632 (34%)</td>
</tr>
<tr>
<td>3. Grid soil samples</td>
<td>639 (35%)</td>
</tr>
<tr>
<td>4. Zone sampling</td>
<td>274 (15%)</td>
</tr>
<tr>
<td>5. Zone sampling by yield monitor</td>
<td>47 (2%)</td>
</tr>
<tr>
<td>6. Not sampling, or samples older than 5 yrs.</td>
<td>88 (5%)</td>
</tr>
</tbody>
</table>

14. When the majority of fertilizer P applied when corn is next crop
n=1814


<table>
<thead>
<tr>
<th>Date Range</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sept. – Nov.</td>
<td>505 (28%)</td>
</tr>
<tr>
<td>Dec. – Feb.</td>
<td>47 (3%)</td>
</tr>
<tr>
<td>March – May</td>
<td>1187 (65%)</td>
</tr>
<tr>
<td>June – Aug.</td>
<td>75 (4%)</td>
</tr>
</tbody>
</table>

15. Method of phosphorus application
n=1782

<table>
<thead>
<tr>
<th>Application Method</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadcast &amp; incorporate &lt;1 week later</td>
<td>805 (45%)</td>
</tr>
<tr>
<td>Broadcast &amp; incorporate &gt;1 week later</td>
<td>257 (14%)</td>
</tr>
<tr>
<td>Do not incorporate</td>
<td>373 (21%)</td>
</tr>
<tr>
<td>Apply to standing crop</td>
<td>115 (6%)</td>
</tr>
<tr>
<td>Not broadcasting P</td>
<td>232 (13%)</td>
</tr>
</tbody>
</table>

16. Limiting factor to higher corn yields
n=1611

<table>
<thead>
<tr>
<th>Factor</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Soil test p is too low</td>
<td>79 (5%)</td>
</tr>
<tr>
<td>2. N rate is too low</td>
<td>176 (11%)</td>
</tr>
<tr>
<td>3. Soil pH is too low or high</td>
<td>148 (9%)</td>
</tr>
<tr>
<td>4. Pests</td>
<td>169 (10%)</td>
</tr>
<tr>
<td>5. Drainage</td>
<td>775 (48%)</td>
</tr>
<tr>
<td>6. Compaction</td>
<td>217 (14%)</td>
</tr>
<tr>
<td>7. Tillage program</td>
<td>47 (3%)</td>
</tr>
</tbody>
</table>

17. How do cover crops mitigate P loss
n=1600

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Will increase P soil test level</td>
<td>99 (6%)</td>
</tr>
<tr>
<td>2. Will increase K soil test level</td>
<td>18 (1%)</td>
</tr>
<tr>
<td>3. Will increase soil pH to 6.8</td>
<td>24 (2%)</td>
</tr>
<tr>
<td>4. May decrease soil erosion</td>
<td>963 (60%)</td>
</tr>
<tr>
<td>5. May improve water infiltration</td>
<td>358 (22%)</td>
</tr>
<tr>
<td>6. None of the above</td>
<td>138 (9%)</td>
</tr>
</tbody>
</table>

18. Critical soil test level for P for corn & soybeans
n=1606

<table>
<thead>
<tr>
<th>Test Level</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 ppm ≈ 28 ppm</td>
<td>758 (47%)</td>
</tr>
<tr>
<td>30 ppm ≈ 46 ppm</td>
<td>349 (22%)</td>
</tr>
<tr>
<td>40 ppm ≈ 50 ppm</td>
<td>425 (26%)</td>
</tr>
<tr>
<td>50 ppm ≈ 70 ppm</td>
<td>74 (5%)</td>
</tr>
</tbody>
</table>
Written Comments

1. Excellent training manual. Good info and easy to read - Nice job!
2. We need more education. People need informed and it was obvious people don't understand there process yet. They are disconnected.
3. Soil PH is a factor to P intake
4. One breakfast was worth the registration fee. Thanks to trainer for professional program and event. Nitrogen program was very good and followed handouts. Phosphorous program became difficult for me to understand and was harder to follow. Projection screen was too small for much of highly detailed PowerPoint slide programs., 6 weather charts on one slide. . Site + meals + service exceptional as always from the Founders Hall.
5. Did not talk on how P.H. I related to nutrient uptake and its effects on fertilizers rates.
6. Would like to have slides from Greg LeBarge.
7. Cities such as Detroit, Fort Wayne, and Toledo should be held accountable for all the large tonnage of sewage sludge that is released in times if high rainfall. This high prosperous sludge ends up in lake Erie, creating the algae bloom issues! What are the cities doing to alleviate this pollution problem?

8. There was a lot of information put out-- somewhat confusing but was a good program.

9. White mold problems on soybeans

10. Excellent job guys -- well done

11. More activities to teach content are needed. Give them something besides classroom lecture

12. Should also enforce laws onto the commercial lawn/landscape companies! They're the dumb people applying in the rain!!!

13. I think the data is fabricated to shift blame to farmers away from cities dumping raw sewage into Lake Erie. The fact that OSU invited President Obama to speak at their university tells me what OSU's political motives are to push this agenda. This appears to be a huge government money grab.

14. Very informative and beneficial! Well done presentation!

15. There was no mention of how commercial applicators are to be held accountable for there over application of fertilizer

16. I saw no landscapers or golf course operators in the meeting, also how are you training the homeowners who apply their own fertilizer

17. What about people in towns and/or cities that fertilize their yards, shouldn't they be limited to fertilizer applications as well?
18. No mention of the total system. Everything in balance (macro/minor/trace minerals), planting time, water management, "Doing Everything Right", Find the weak spots in the whole system.

19. The slides did not match the book

20. This fertilizer training program appears only to be a way to satisfy special interest groups so that farmers know what they are doing. When the actual truth of the matter is we don't want to apply more fert. than necessary.

21. Once again, our tax dollars are at work: It doesn’t take a rocket scientist to figure out tile will remove much quicker than not. Soil had a way to remove excess nutrient through percolation and wetlands. Now we systematic tile and drain wetlands. What did you expect? Solutions! Curl systematic tiling and use riparian buffers. 2. Are homeowners and lawn care people monitored and regulated from application of N, P, and K? Why do farmers take most of the crap? 3. Put figures in English, not metric! Should have date and figures calculated and up to date so there is no guessing or speculation. 4. CRP should be considered! Money seems to be more important that conservation. How sad! look at central and southern Darke county corn and soybean desert.

Distribution of FACT Evaluations from two and three hour meetings
December 2014 – April 2015

<table>
<thead>
<tr>
<th>Region</th>
<th>Freq</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Western Lake Bas</td>
<td>1215</td>
<td>58.6</td>
</tr>
<tr>
<td>Western Lake E Basin</td>
<td>859</td>
<td>41.4</td>
</tr>
<tr>
<td>Total No Evals</td>
<td>2074</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Frequency Distribution by EERA

<table>
<thead>
<tr>
<th>EERA</th>
<th>Freq</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>TopofOhio</td>
<td>574</td>
<td>27.7</td>
</tr>
<tr>
<td>ErieBasin</td>
<td>390</td>
<td>18.8</td>
</tr>
<tr>
<td>Crossroads</td>
<td>376</td>
<td>18.1</td>
</tr>
<tr>
<td>MaumeeValley</td>
<td>348</td>
<td>16.8</td>
</tr>
<tr>
<td>HeartofOhio</td>
<td>181</td>
<td>8.7</td>
</tr>
<tr>
<td>OhioValley</td>
<td>90</td>
<td>4.3</td>
</tr>
<tr>
<td>MiamiValley</td>
<td>51</td>
<td>2.5</td>
</tr>
<tr>
<td>WesternReserve</td>
<td>41</td>
<td>2.0</td>
</tr>
<tr>
<td>BuckeyeHills</td>
<td>23</td>
<td>1.1</td>
</tr>
<tr>
<td>Total</td>
<td>2074</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Private Pesticide Applicator Training Evaluation Summary
December 2014 – April 2015

1.) Total Evaluations Collected: 708

   Number of acres owned, rented or worked:
   Minimum acreage: 1
   Maximum acreage: 5100
   Average acreage: 456

2.) Number of acres owned, rented, or worked where pesticides are applied:
   Minimum acreage: 1
   Maximum acreage: 7000
   Average acreage: 391

3.) Have you improved your pesticide use practices as a result of the pesticide education programs that you have attended over the years?
   Please rate your agreement with the following statements:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have improved personal safety practices n= 698</td>
<td>13 (2%)</td>
<td>4 (1%)</td>
<td>35 (5%)</td>
<td>432 (61%)</td>
<td>212 (30%)</td>
<td>2 (0%)</td>
</tr>
<tr>
<td>I have improved practices to protect the environment n= 697</td>
<td>12 (2%)</td>
<td>4 (1%)</td>
<td>26 (4%)</td>
<td>425 (60%)</td>
<td>228 (32%)</td>
<td>2 (0%)</td>
</tr>
<tr>
<td>I have improved pesticide handling practices (mixing, loading, storing, applying) n=696</td>
<td>11 (2%)</td>
<td>2 (1%)</td>
<td>46 (7%)</td>
<td>391 (55%)</td>
<td>242 (34%)</td>
<td>4 (0%)</td>
</tr>
<tr>
<td>I get better control from pesticide applications n= 688</td>
<td>11 (2%)</td>
<td>6 (1%)</td>
<td>115 (16%)</td>
<td>363 (51%)</td>
<td>187 (26%)</td>
<td>6 (0%)</td>
</tr>
<tr>
<td>I use pesticides more cost effectively n=683</td>
<td>12 (2%)</td>
<td>4 (1%)</td>
<td>93 (13%)</td>
<td>380 (54%)</td>
<td>187 (26%)</td>
<td>7 (1%)</td>
</tr>
</tbody>
</table>
4) These questions apply to today’s training:

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have learned how to control pests, diseases, or weeds more effectively n=696</td>
<td>13 (2%)</td>
<td>2 (1%)</td>
<td>42 (6%)</td>
<td>415 (57%)</td>
<td>224 (32%)</td>
<td>0</td>
</tr>
<tr>
<td>I am better informed about how to apply pesticides safely n=693</td>
<td>13 (2%)</td>
<td>3 (1%)</td>
<td>30 (4%)</td>
<td>408 (59%)</td>
<td>239 (34%)</td>
<td>0</td>
</tr>
<tr>
<td>This program brought me up to date on current pesticide-related topics, issues, or regulations n=694</td>
<td>13 (2%)</td>
<td>2 (1%)</td>
<td>10 (1%)</td>
<td>376 (53%)</td>
<td>293 (41%)</td>
<td>0</td>
</tr>
</tbody>
</table>

A. What is the most important thing you have learned today?

Options for grain bin fumigation  
New products available  
Drift and nozzles  
Importance of spray nozzle and application  
Read Label  
Explanation of a temperature inversion  
New pesticides  
anew pesticides  
fungicides only work with correct timing of application  
Not all measurements equal  
Safety  
Dangers of fumigation  
Calibration info.  
mold board plowing has a place in today’s farming, mold board plowing will make a comeback  
Weed environments are changing  
Sprayer management  
measuring and calibration and pesticide and disease control  
safety on handling fungicides  
pesticide measure  
Fumigation  
safety, calibration on sprayer  
old products with new homes  
New weeds to watch out for  
Have not confirmed Palmer amaranth in Erie County yet  
Timing/rotation  
Be careful  
same as always pay attention  
Drift Control  
Pesticide Safety  
Weed control  
That a calm day is not the best time to spray  
New herbicides, ponds, crops  
Don't spray at 0 wind speed  
Name and combination of spray and calibration of spray  
control weeds and tread grain  
safety  
Weed control and threats  
accuracy of measuring herbicide notes  
chemical combinations and different names, resistant weeds  
Chemical and spray tanks may not be calibrated correctly  
Mt and PA control  
Post I.D.  
The importance of correct nozzle selection  
Be careful  
weed control on no till reeves  
some different weed control  
control of material, water temp  
New weed program in Ohio, Control of resistant weeds  
New weed resistance  
How much wind plays a factor  
Ohio Sensitive Crop Registry  
New products
Water pH
MOA
Measuring devices
measuring chemicals
measuring
Different measuring containers
Concise measurement is crucial
Fertilizer regulations

Fly control
Pesticide use, Bees
New sprays/bugs
Insecticides seed treatments may not be effective
Identifying and contacting apiaries w/ in 1/2 mile of operation

Stay updated on products and uses
Importance of accurate measuring
Safety/Mixing
New Pesticides and comparing
Fluid measurement vs. Dry measurement
New products
Correct Measurement
Safety
Willow bush management
safety
Pinkeye control
Marestail control
How fast weeds reproduce and spread, How important it is to recognize and control early
Updates and safety
Toxic weeds that effect livestock, Proper measurements of pesticides
Measurement of dry and liquid pesticides
Lyme disease

All ounces are not equal
Marestail control
Read labels and documents
Be cost effective, More is not always best
Phosphorous run-off related to poison Hemlock
Measuring chemicals, Flow meter to mark tank
Measurers are not always true
Weed resistance
Mode of actions
MOA/SOA charts
Herbicide groups, Manure bugs
SOA

Herbicide class chart
Measuring cup herbicides, Weed control
The importance of multiple SOA

Use of different herbicides to control weeds
pH water quality
Watch your measurements
Measuring properly
Mixing of solids and liquids
Ash Bore, Rose disease
New chemicals and procedures
Measuring sprays different in measuring cups, containers, and tanks
Better, safer application/mixing techniques
Mixing herbicides, Neonics, Bees
Fumigants
Accurate measuring
SWD traps and ID

Be safe
Marestail seed life span
New Pesticides
Use of adjuvants
New products
New results of new chemicals or additives
New herbicides and pesticides to use
livestock section
invasive species
Rates of use
Calibration
Calibration
Good to use a water meter
Dry measurements should be by weight

Safety
Ticks

Toxic weeds
Tillage can be effective against problem weeds,
Do not abuse herbicides, Use different MOA
Details of mixing
Weeds getting carried in other materials
Marestail control
Correct measure is needed
Pesticide volume
Emerald Ash Bore
MOS, SOA chart
Pesticide group #
New chemicals
Action poster
MOA and SOA on herbicide
MOA is extremely important in managing resistant weed populations
MOA/SOA
Herbicide classifications
Ticks
Ticks
Measurements
Weighing is more accurate
Chemical measurement, Test soils
Measurement
Nozzles

Measure containers for spray, Trees and bugs

Phosphorous

Updates
How to correctly measure or weigh out chemicals
Use scales
Weed control
Measuring properly
Measuring or weighing product properly
Measure and weigh chemicals carefully
Safety handling chemicals
Updates on weed control
Type water pH
How water pH effects chemicals

Modification of water to be more compatible with spray being used
Info on pH and acidic levels and the effect on application process
Methods of control for Marestail
Testing the water, Lasting effects of pesticides,
How "new" weeds are getting started
How water effects spray
How to control weeds
Awareness
Critical time to control weeds
How pH and hardness effects
Forage crops

Bayer insecticide seed treatment does not work.

Weeds
New chemistry in fruits
Sprayer management
Measuring chemicals

New insects and plants
Nozzle types
Learning to kill pesticides
Pink eye
Good Review
updates
Safety
Weed control
Weed control practices

How to use and not to use pesticides
Weigh everything
Weed control in forages
Be careful when applying pesticides
Safety
Control
Palmer Amaranth
Ticks

Invasive pests and controlling them
Measuring devices
Measurement in containers
Read labels
Mare Tail weed
Spray application
Weigh chemicals don't measure
Measurements
End date of Endosulfan use
Measure and weigh chemicals carefully
Toxic weeds
Water electiveness on spraying
Some of the problem weeds, insects, and how to control them
Thistle control

Different kinds of weeds

Water use, Surfactants
Water pH makes a difference on how effective spray is
Info on fertilizer certification
Invasive plants and insect pests
Water pH
Pasture weed control
Be safe
Times are changing, Consumers are getting a bigger say in some issues.
Measurement accuracy between like products in different years.
Up to date regulations
How to control Marestail
Not to fumigate
Using the right amount of chemical and weighing it
Measuring
Read
About chemicals
New pesticides being developed
pH control and hard water issues
Measurement Techniques
New problem weeds
Safety
Water pH and changing after 24 hr period
PPE requirements
Safety in handling pesticides
New weeds and bugs
ODA can punish you for drift
New insects in our area, New laws safety
Ways to control resistant weed
Black rot grapes
measurements dry vs. liquid, mixing of chemicals to avoid resistance
rotation
Surfactants
Importance of adjuvants
Mixing spray
measure pesticide covertly

Public awareness has caused us to be more cautious than ever
water quality
conditioners and buffers for spray
water quality and drift
water quality
water quality and impact on chemicals
pH control and hardwater issues
Measurement Techniques

Main Stable control
Stink Bugs
Better way to control marestail
Weed control and new chemicals
Different mixture and trade names of each
control of marestail
Enlist tech.
Check Measuring Cups
Volume vs. density - new containers to measure per same herbicides
Measure accurately
The new spotted DSWP
Use current measuring devices for dry pesticides measure accurately
Stink bugs and tomato blight
Safety
Be proactive in asking for help with issues
Herbicide mode of action
Label is the law
The law
Fumigation rules
New products
Read the label
Safety

Legume use
Stay current
Liability of spraying
New bugs
Watch wind drift
proper sprayer calibration
Pesticide safety
weigh product instead of using container markings
sprayer tips on calibration

Water intersecting with chemicals
importance of surfactant
Weed control and Invasive Pest
Measure Carefully
I liked the focus on soil testing, also heard a fair bit on economic threshold levels - good stuff.
Importance of using multiple product in a group or groups to be more effective
water quality
Phosphorus run off and marestail
water(the importance of testing)
water quality affects spray effectiveness
Good Review updates
Better understand new herbicides and cattle disease
Weed Control
Resistance started on certain weeds
proper use of pesticides
Be careful
Control of marestail is important
New weeds
new things
Pesticides that have been less effective than others
To handle all products used for Pest and weed control
How to apply chemicals at the proper rate
Importance of correct measuring devices
Safety and prevention
measure more accurate
Modes of action, Sites of action
Modes of action
Measuring container not all the same
The impact of insects on crops
P movement with water
Info on Palme
Safely apply pesticides and weed control
Weed/pest resistance update
Take care of bees
New products
What was not covered today, - you would like more information?

- cover crops
- mixing procedures
- application of pesticides on livestock

More info on weed identification
Control of Russian Olive, Tree of Heaven, and Grape Vines
Fly control for cattle
Weed control in pasture and forage crops
Buffer strips around waterways
Health Awareness Toxicity
All covered
Mixing order of chemicals
Crop safety of various herbicides according to soil types and other variables
More pros and cons
Drift management
lawn application
Cucumber vine control

Wind speed
Grapes
Greenhouse info.
Storage and handling
How to rate adjuvants

Additional Comments

Good session

Sprayer techniques, Fertilizer rules, Soil test info
Spray tip info, Calibrating sprayer with spot dot, Pressure gauge maintenance
Variety of modes of action available in sprays, Air injected nozzles, brownies taste great

Marestail control, Spray nozzle tip demo really cool, Testing of pressure gauge

Very enjoyable class
Good session!
Good program!
Weekend recert classes?
Great job!
Very interactive question and answer period at all sessions
I liked the copies of the overhead to make notes on
Good class! Thanks!
Helpful
Presented well
Well presented

Timing of phosphorous application, Sprayer calibration importance, Importance of crop rotation and varying chemical families
Herbicide classification
Spray nozzles, Spot on calculator, Cover crop relation to phosphorous
Different nozzle size spray pattern, Effects of spray drift, different nozzles used for different types of spray
All 3 instructors did a great job!

Thank you for your time and knowledge!
Very good! Best recert yet!
Excellent presentation!
Best one yet!
Fine program!
Good!

Very educational!

Well Done
Couldn't see well
Very informative and educational!
APPENDIX B:
EVALUATION / IMPACT
APPENDIX D:
IMPLEMENTATION OF PROGRAM STRATEGIES
APPENDIX E:
ADDITIONAL INFO / REPORTS