Partnering with your County Cooperative Extension Service Office
and
Soil Phosphorus in Kentucky MS4 Communities

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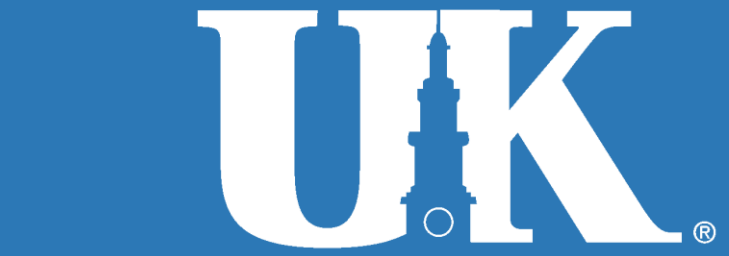
NEEF

COOPERATIVE
EXTENSION
SERVICE



UNIVERSITY OF
KENTUCKY®

College of Agriculture,
Food and Environment

History

Morrill Act of 1862
Smith-Lever Act of 1914

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Extension provides **practical**, **research-based** education to help people, businesses and communities build a better future.

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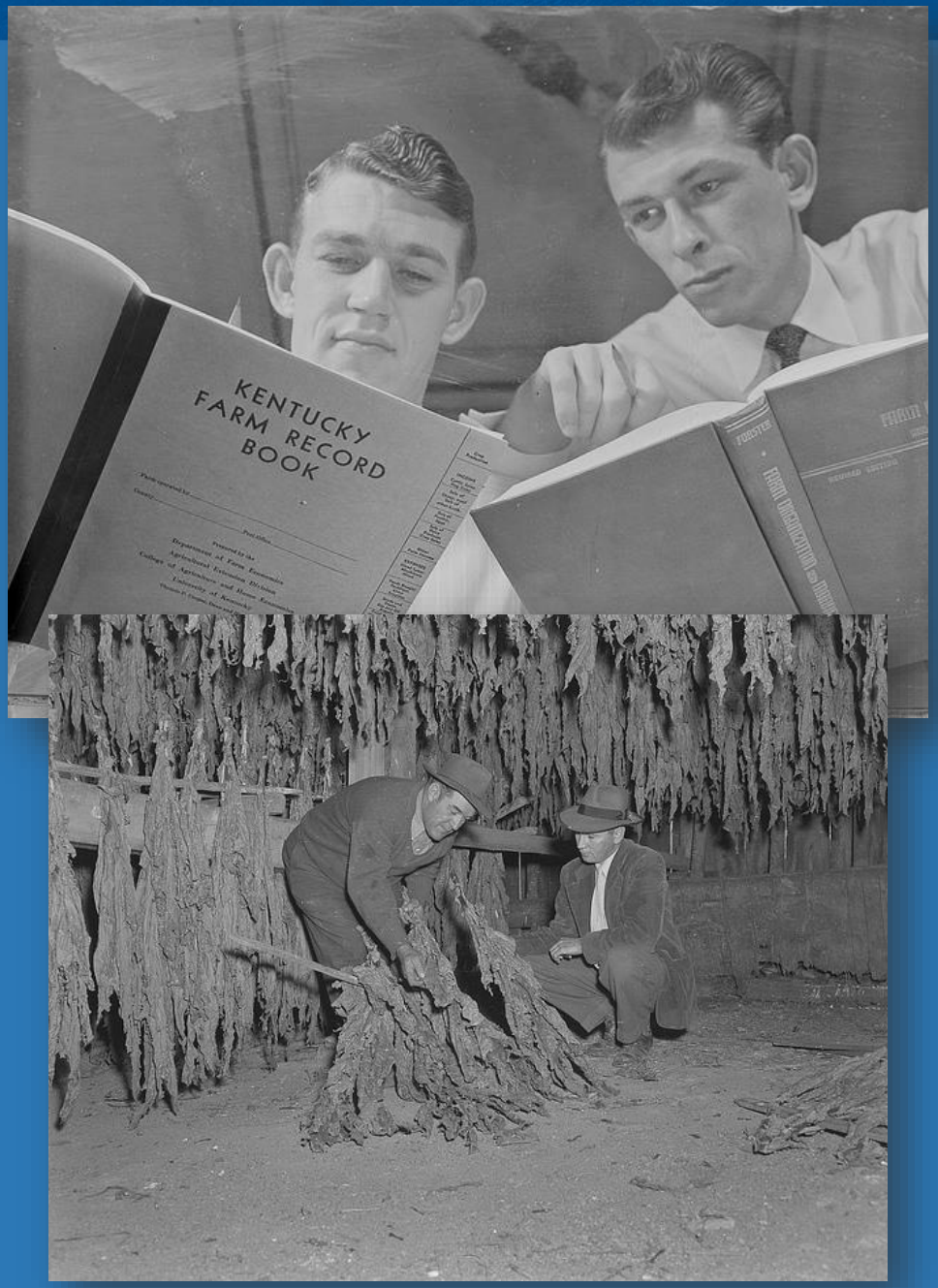
Historically, rural audiences…

Agricultural production…



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Historically, rural audiences…

Food and clothing demonstrations…

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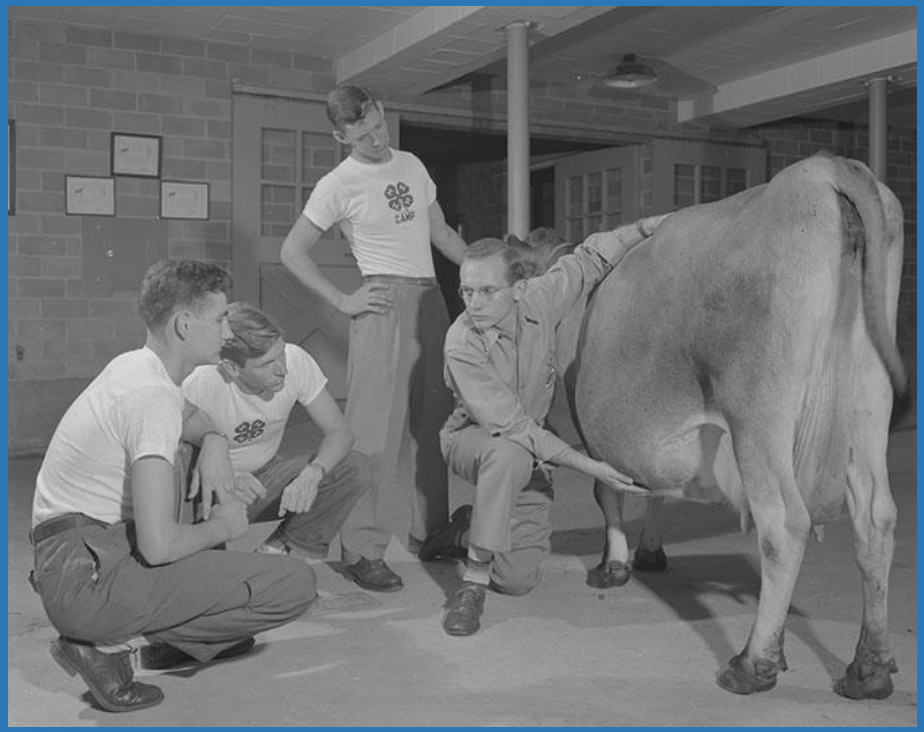
Image Citation: UK

Historically, rural audiences…

Youth education…



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Kentucky Cooperative Extension serves the needs of all Kentuckians, with new emphasis addressing urban clientele needs.

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ANR/HORT – Urban agriculture

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FCS – Financial management and nutrition

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4H – STEM, nutrition, health, leadership

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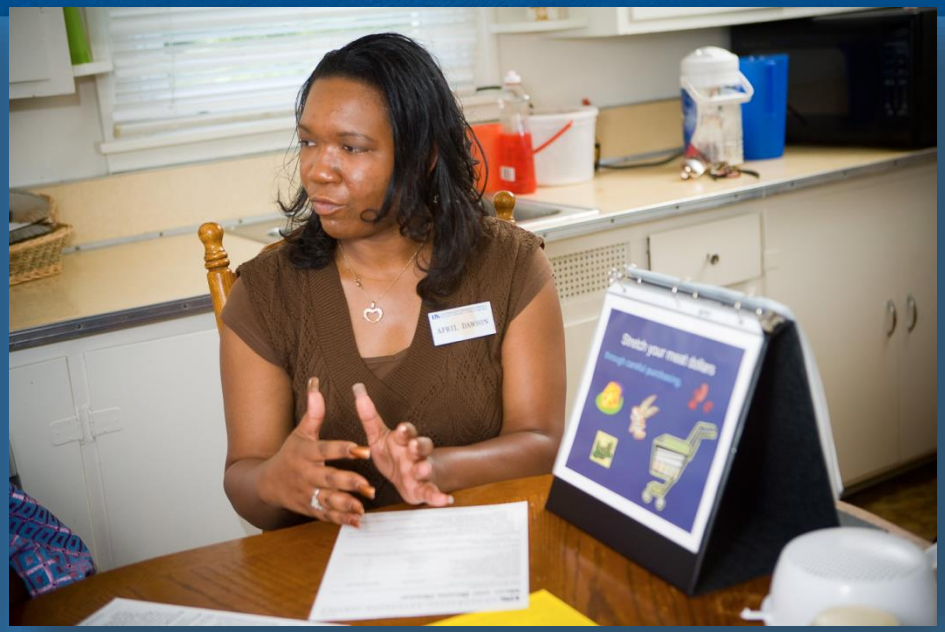

EXTENSION

Image Citation: UK

Offices in every county with agents in three major program areas

ANR: Agriculture and Natural Resources

FCS: Family and Consumer Sciences

4-H: Youth Education and Leadership

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Image Citation: UK

Cooperative Extension Service

- 120 offices
- Over 100 years in existence
- Connected in your community

Why is CES interested in helping you?

- Our mission includes education and outreach
- 104 MS4 communities within 32 counties
- These 32 counties represent 65% of Kentucky's population

Why Should CES be Involved?

- **Strengthen CES relationship with urban clientele**
  - Stormwater management is an unfunded mandate by the federal government
    - Ag minimally regulated (animal) and CES has been supporting this clientele base for a century
    - Cities (> 10,000 population) ARE REGULATED and need help meeting permit requirements
  - Communities must address stormwater utilizing local resources
    - Assess fees (Fayette Co. - $4.63/2500 ft^2 of impervious surface)
    - Utilize community budget (taxes)

Why Should CES be Involved?

- **Increase CES relevance to urban audience**
  - Rural population migrating to cities
    - Worldwide urban population expected to increase from 54% in 2014 to 63% by 2020 (World Health Organization)
    - 65% of Kentuckians reside in 32 counties
    - Kentucky (~3% rural → urban migration 2000 to 2010)
  - Urban population losing connection to surrounding environment
    - < 30% of Kansas HS students could answer basic agricultural questions (Horn and Vining, 1986)
    - Rural/town children know more about agriculture and natural resources **(ANR)** than city children (Frick et al, 1995)

Why Should CES be Involved?

- **Increase environmental literacy**
  - 78% of Americans do not understand that runoff (both ag & urban) is now the most common source of water pollution (Coyle, 2005)
  - Almost half of all Americans believe industry accounts for most water pollution (Coyle, 2005)

How can CES get involved?

- Share our experience and knowledge of the community – **CES is connected to the community**
- Share our data… e.g.
  - Soil samples collected in your county
  - People educated via various transfer methods (for example)
    - Volunteer hours and activities
    - Number of people attending certification and training courses
    - Attitude surveys
    - People participating in workshops, meetings
    - Number of bulletins distributed
- Share our impact statements related to water quality work

MCM 1: Education and Outreach

- Each office collects data on a monthly basis, including…
  - Date of a workshop/meeting/event
  - Title of workshop/meeting/event
  - Type of audience attending
  - Number of participants

MCM 1: Education and Outreach

- Media outreach distribution
  - Print: Extension bulletins, fact sheets, handouts…
  - Radio and TV: some counties have a regular show
  - Newspaper: regular column in many local papers
  - Social Media: county offices and programs often have their own web pages

MCM 2: Public Involvement

- Attitude surveys (example)
  - Level of Understanding Before and After the Program
  - Behavioral Change (e.g., install a rain garden)

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Level of Understanding (n ~ 100)

Understanding	*Pre-workshop*	*Post-workshop*
Stormwater runoff	2.3	3.6
Why RG are beneficial	2.0	3.8
How to select RG site	1.5	3.7
How to design a RG	1.4	3.5
Selecting plants for a RG	1.7	3.5
How to install a RG	1.5	3.7
How to maintain a RG	1.5	3.6

In general, relatively low understanding prior to workshop. Knowledge increased substantially after the workshop.

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Proposed Actions After Workshop

Action	*% Yes*
Continue to learn more about RG	91
Will install a RG	94
Learn more/adopt other water quality BMPs	93
Will conserve water in the landscape	95
Educate others regarding water quality BMPs	94
Incorporate these topics into youth activity	95

There was a very high level of potential adoption of one or more stormwater/water quality best management practice.

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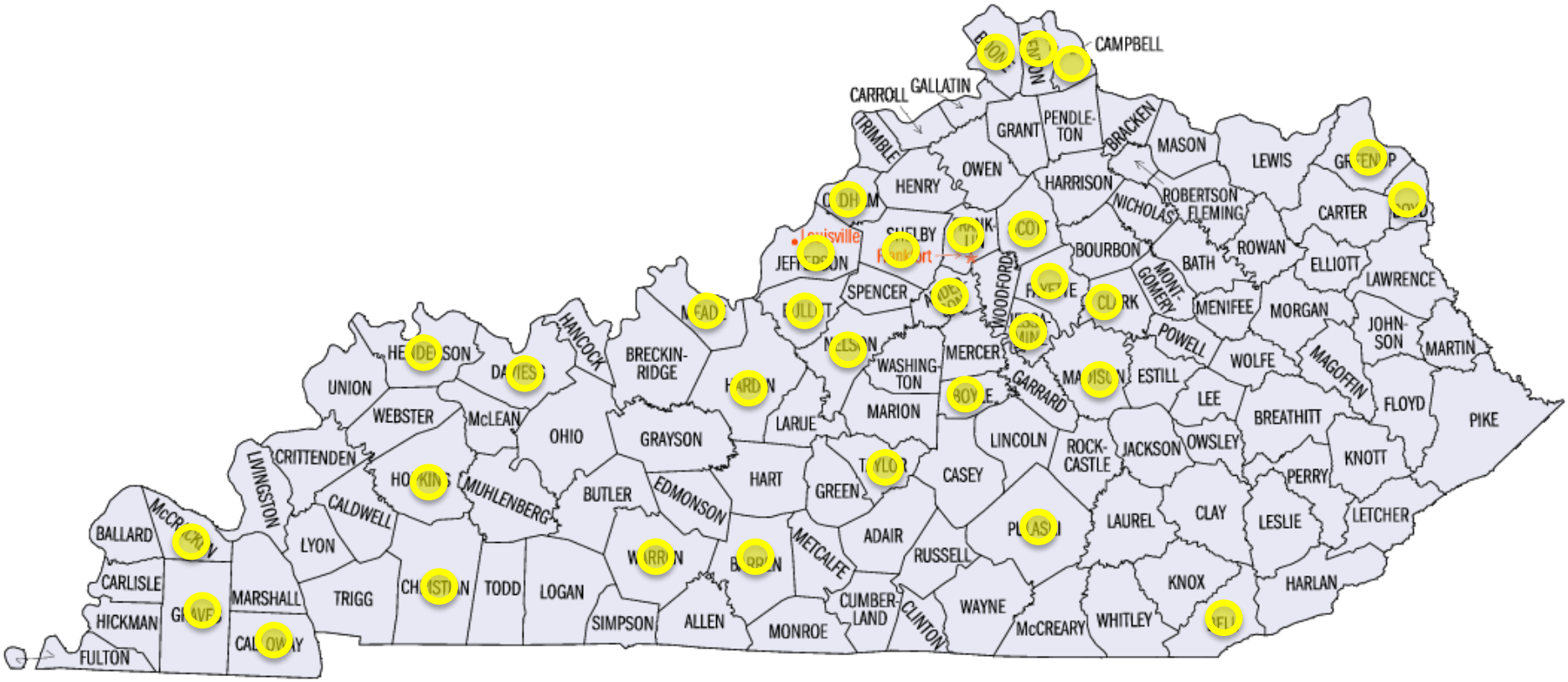
Counties with MS4 Communities



~1/4 of Kentucky counties have 2/3 of the population

Connections in Communities

- Contacts in 32 MS4 counties
  - Reported monthly
  - July 1, 2014 – June 30, 2015
    - ***16,848,927***

- How many of these are stormwater related?
  - **25% (4.2 million)**
  - **50% (8.4 million)**
  - **75% (12.6 million)**

Reduce discharge of pollutants to the maximum extent practicable

Image Citation: Ashley Osborne, UK CAFE

Why not ask your CES office for assistance in meeting MCM 1 and 2?

Measurable Goals Guidance for Phase II Small MS4s

http://www.epa.gov/npdes/pubs/measurablegoals.pdf pg 36

- List of measurable parameters (pg 36)
  - Public outreach and education on stormwater impacts
    - Lawn and garden activities
      - **<u>Number of requests for soil tests</u>**

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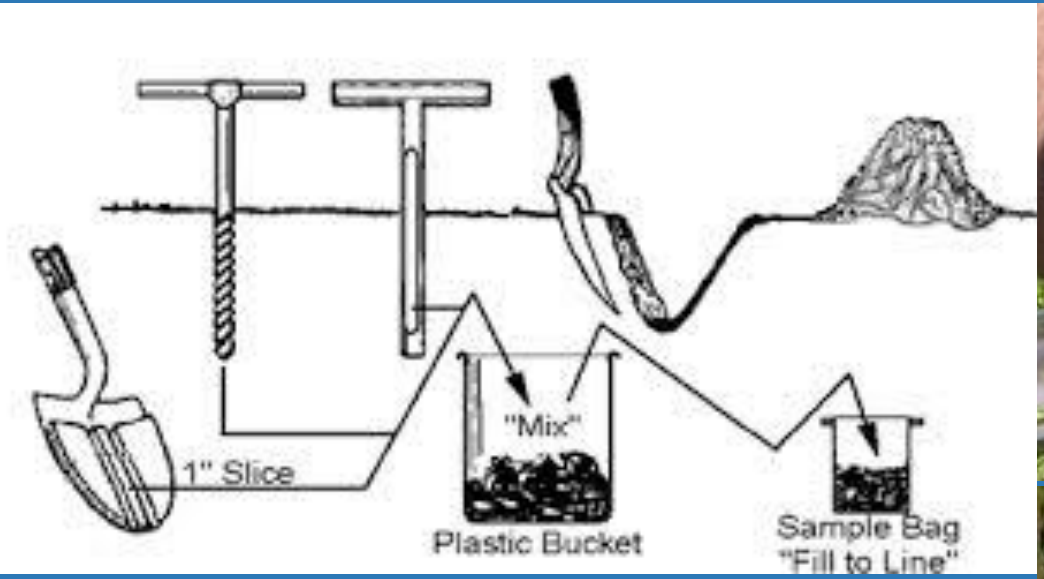
Document in notes

Soil Tests

Fertilizer recommendation is made based on test results by UK for the desired crop/landuse



Cost varies by county

Free to ~ $10

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Nutrient Management

- Right source
- Right rate
- Right time
- Right place

- *Excess phosphorus contributes to freshwater eutrophication*

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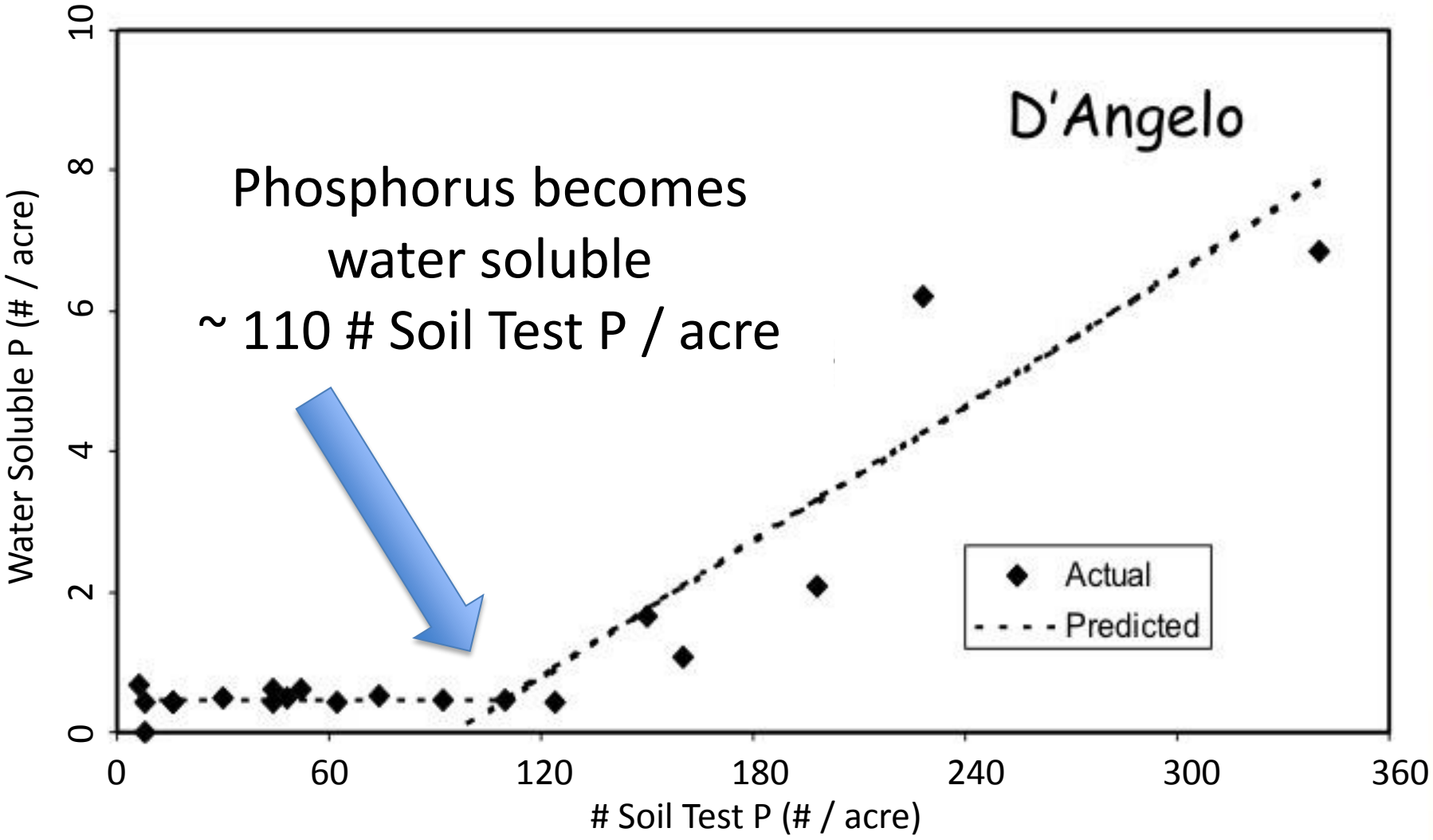
Predicting Water Soluble P from Soil Test P on Twenty Kentucky Soils



25 year urban (home lawn and garden) soil test phosphorus summary

1990 - 2014	Samples (n)	Low (%) >30 # / acre	Med (%) 30-60 # / acre	High (%) 60-120 # / acre	RISK (%) >120 # / acre
Average Kentucky MS4 County	3680	18	15	18	**49**

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25 year soil test phosphorus summary

Jefferson County

1990 - 2014	Samples (n)	Low (%) >30 # / acre	Med (%) 30-60 # / acre	High (%) 60-120 # / acre	RISK (%) >120 # / acre
AG	*1794*	*38*	*23*	*18*	***21***
URBAN	17691	14	15	19	**52**

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Urban soil test phosphorus 25 year soil test summary

1990 - 2014	Samples (n)	Low (%) >30 # / acre	Med (%) 30-60 # / acre	High (%) 60-120 # / acre	RISK (%) >120 # / acre
Hopkins (low)	2832	34	22	18	**26**
Daviess (median)	3885	16	18	21	**45**
Jessamine (high)	1223	1	2	8	**89**

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25 year urban soil test P summary

- Urban soils are considerably higher in soil test phosphorus than agricultural soils

- In the urban soils, water soluble P (> 120 # P/acre) is highest in the Bluegrass Physiographic Region

- In 28 of 32 counties over 50% of urban soil test results had greater than 60 # P / acre
  - ✓ economic threshold for turf & most garden crops
  - ✓ range 42% to 97%

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What can be done with soil test information?

- Educate folks about environmental impact of nutrient runoff in your community… **AND**…
- What about a baseline? Your goal may be to increase number of soil tests in your community.
- Your county CES office can help.

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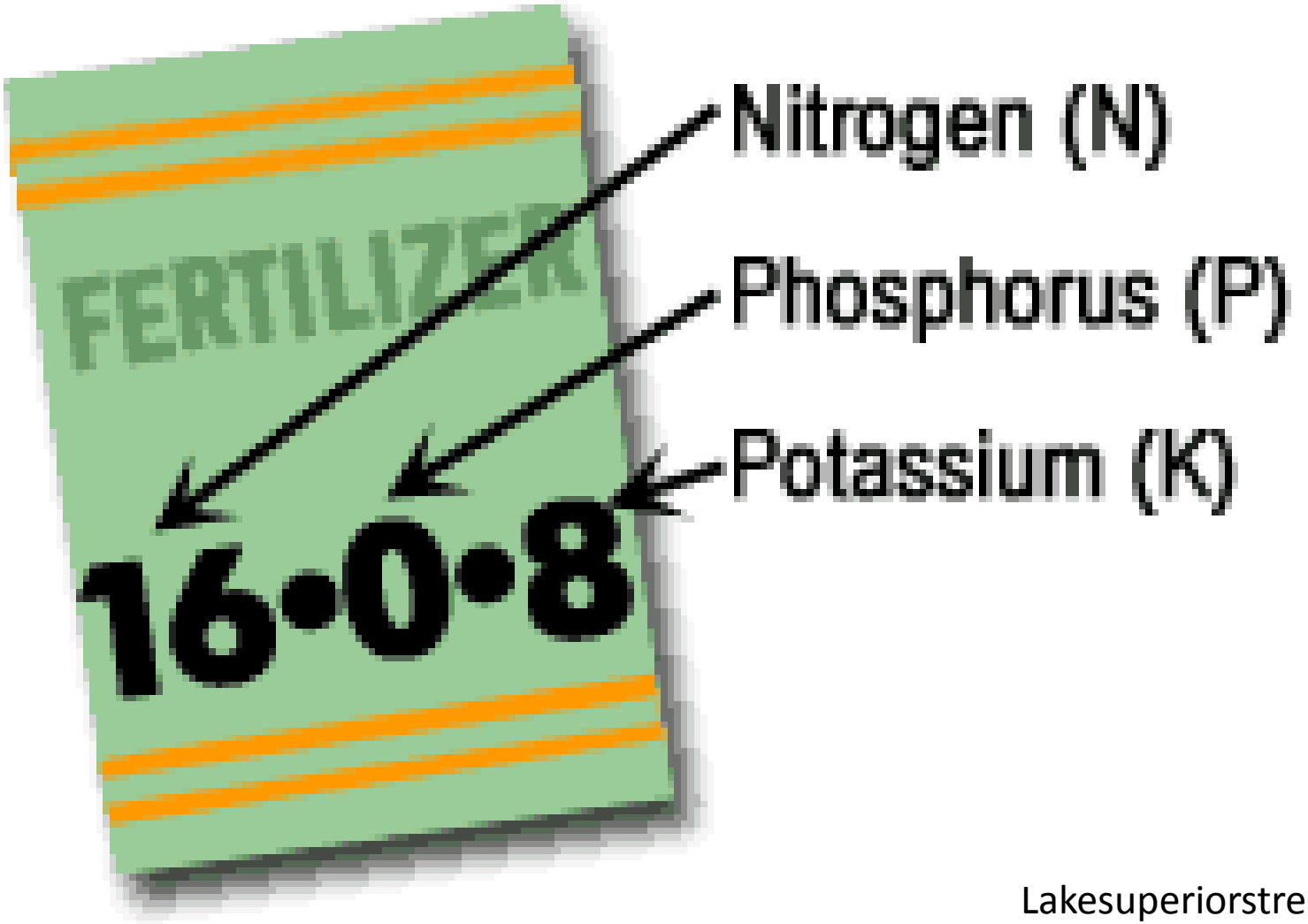
Some states passed laws for lawn maintenance



Lakesuperiorstreams.org

Maine.gov

2008 Law

You can buy P fertilizer if your soil test indicates your soil is deficient

States that Banned Sale of Phosphorus Fertilizer for Lawn Maintenance

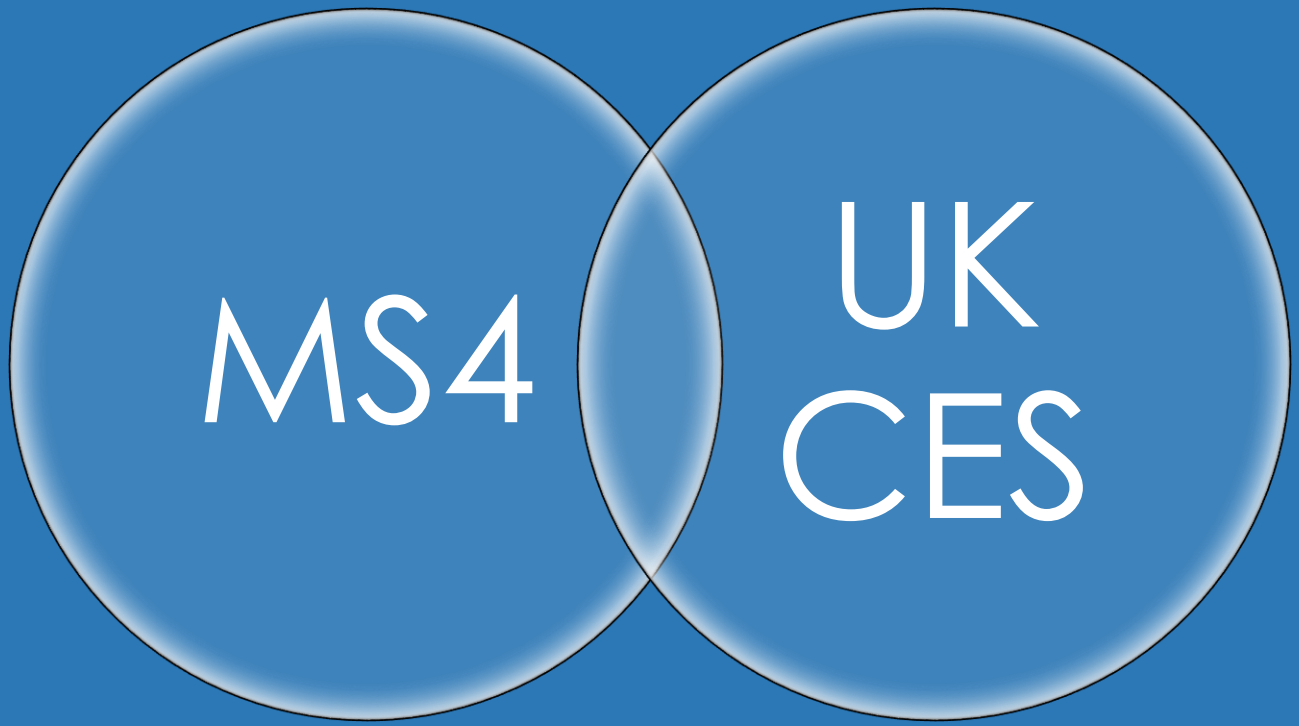
Is P – free fertilizer available?

Scotts drops phosphorus from lawn fertilizer

Marysville company acts to reduce risk of runoff feeding toxic-algae blooms in lakes; competitors likely to follow its lead

Columbus Dispatch - May 10, 2013

We propose a partnership…
Stormwater Education



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Stop by our booth to talk about how CES can help you.

For example…

MEASURABLE GOALS GUIDANCE FOR PHASE II SMALL MS4s

Education and Outreach for Commercial Activities

- Number of certified businesses that participated in training for a “green certification” program

- Number of businesses trained under a training program

MEASURABLE GOALS GUIDANCE FOR PHASE II SMALL MS4s *continued*

Lawn and Garden Activities

- Partnerships established with local lawn care business
- Partnerships established with lawn care suppliers/retail stores
- ***Fertilizer and pesticide residues in runoff***
- ***Requests for soil testing***


"Cement Fertilization"

1 ton grass clippings has
15# N, 2# P, 10# K

0.75 – 0.2 – 0.6

Thelawninstitute.org

Thank you for your time

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