Turf Fertilizer Laws Midwest

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Water quality is a priority in Minnesota

Shapiro et al., 1974

- Study conducted on health of lakes in TCMA
- Street sweeping reduces P concentration in runoff

Time of Year	Storm Drain TP Conc
Feb. to mid-June	0.587 mg/L
Mid-June to mid-Oct.	0.256 mg/L
Oct. after leaf fall	1.095 mg/L

Shapiro et al., 1974

- “Institution of the use of fertilizers with zero-phosphorus will probably not materially reduce the concentration of phosphorus in runoff.”

Local thing . . .

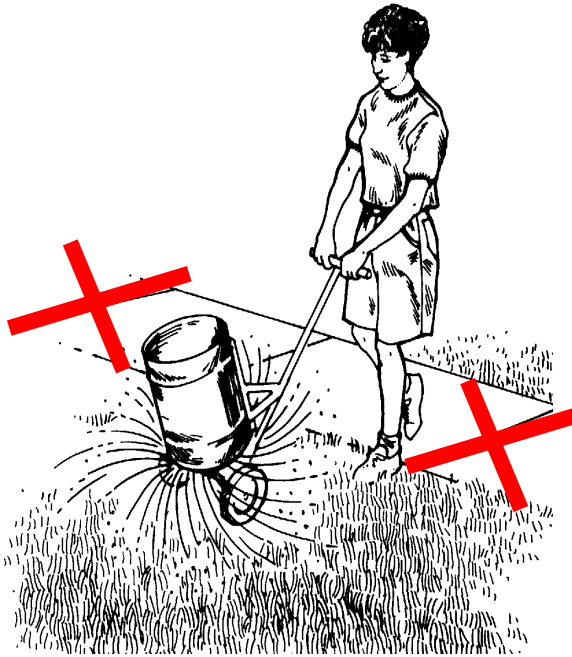
City of Shorewood, MN

Jose Ruiz photo

Year	Action
1985	First city passes “low P” (3% P_2O_5 or less) ordinance. Several cities followed suit with “low P” ordinances over next ten years.
1996	First city passes “zero P” ordinance for commercial applicators.
2000	First cities pass “zero P” ordinance for both commercial and private applicators. Served as model for state legislation.
2000 - 2001	MN Department of Agriculture twice sponsored legislation for state restrictions on phosphorus lawn fertilizer use. Bills did not pass but raised awareness of issue by legislators, policy makers, and public.
2001 - 2002	Broad coalition formed to promote state legislation. MN Department of Agriculture active in bringing groups together and refining legislation.
2002	**Phosphorus Lawn Fertilizer Law passes**. Restricts use to “zero P” in Twin Cities counties; “low P” elsewhere. Restrictions started 2004.
2004	Subsequent legislation took “zero P” restriction state-wide in 2005.

A restriction, not a ban …

- Law allows the use of phosphorus lawn fertilizer but only when these situations exists:
  - A soil test or plant tissue test shows a need for P;
  - A new lawn is being established by seeding or laying sod;
  - P fertilizer is applied on a golf course by trained staff;



MN Golf Course Personnel

- Over 475 people have attended
  - 4hr core training
  - Offered yearly
  - Award winning Extension Program

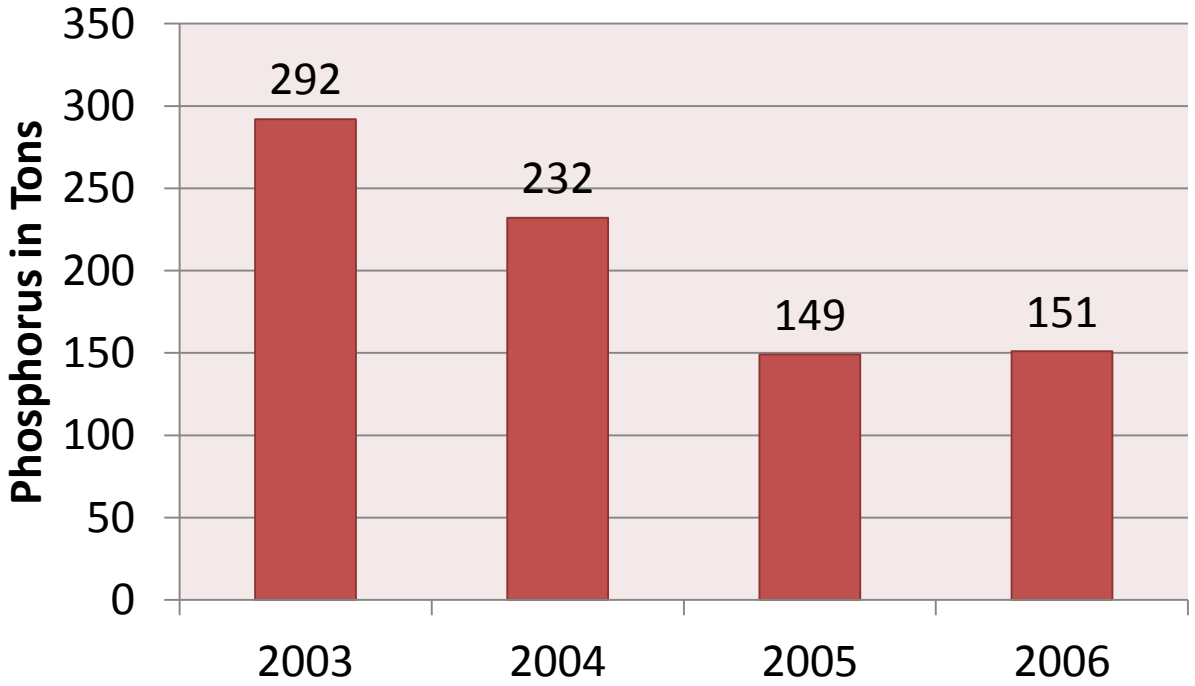
- Paper published in Journal of Extension

Horgan, B.P., P. Bierman, and C.J. Rosen. 2003. Phosphorus fertilizer training program for golf course personnel. Online. J. of Extension. http://www.joe.org/joe/2003october/tt6.shtml.

Evaluation Report - 2007

1. 82% of lawn fertilizer sold in 2006 was “zero P”.
2. Phosphorus sold decreased 48% from 2003 to 2006.
3. No reports of law being enforced by local governments (warnings made, no fines).

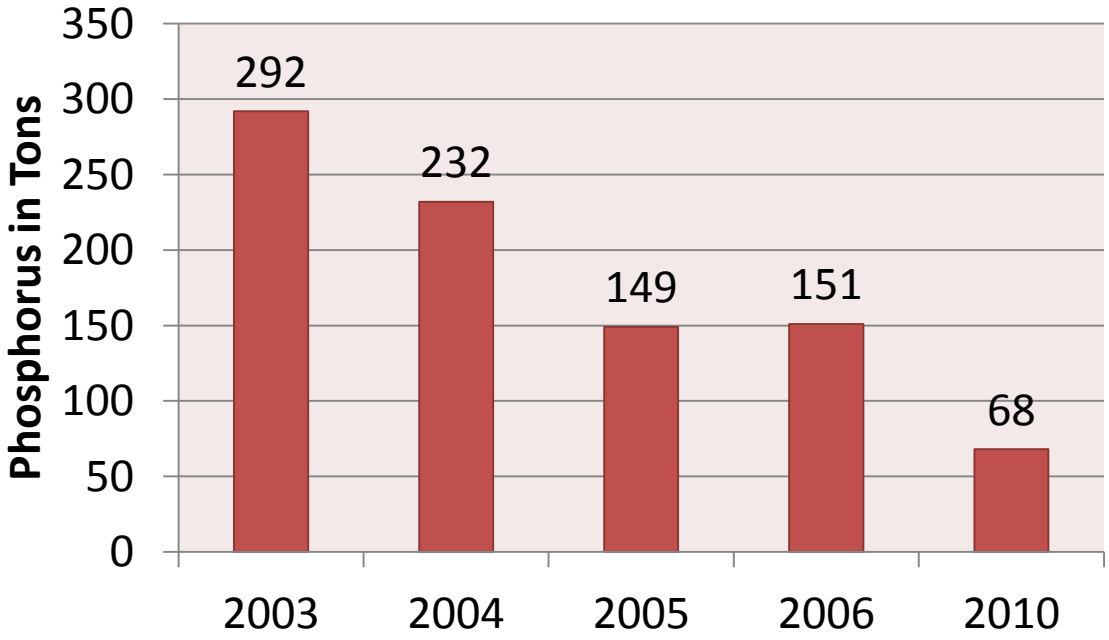
Tons of phosphorus contained in sold lawn fertilizer



By 2010…..

- 91% of lawn fertilizer sold in 2010 was “zero P”; up from 82% in 2006.
- Phosphorus sold decreased 77% from 2003 to 2010.

Tons of phosphorus contained in sold lawn fertilizer



Evaluation Report - 2007

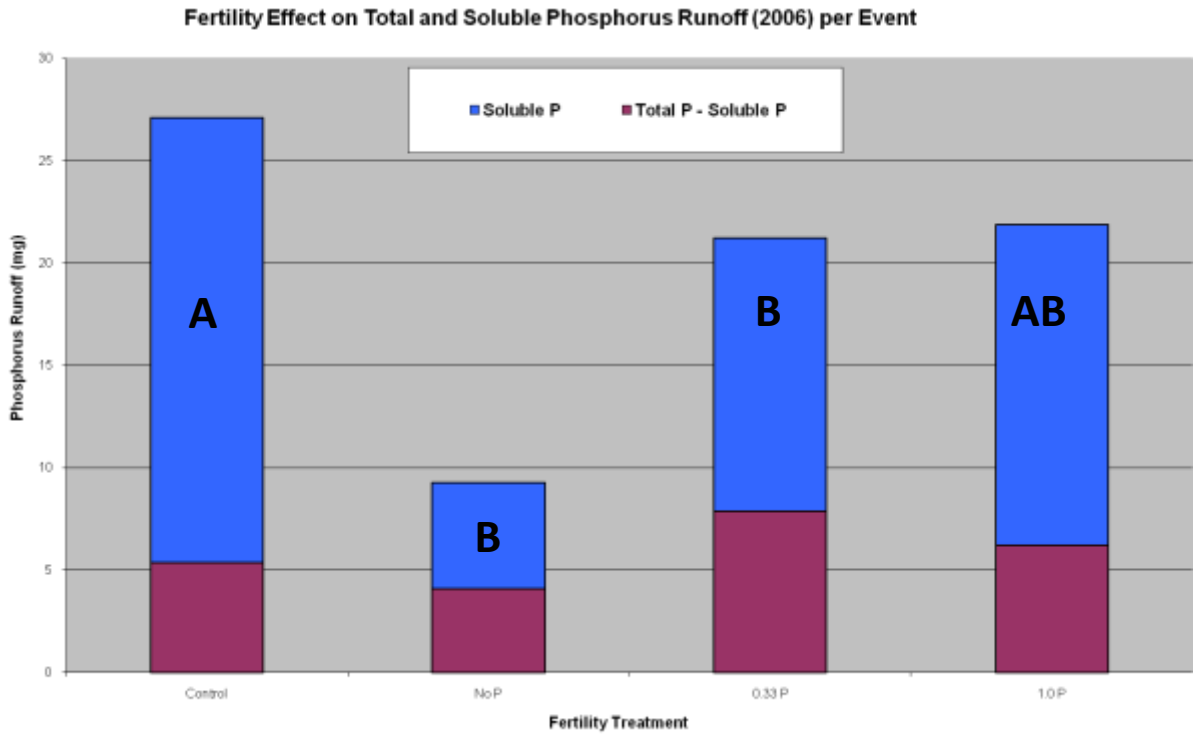
4. No changes in water quality documented.

5. Research needed to:
   a) quantify changes in water quality
   b) turf health impact

cleanwaterMN.org

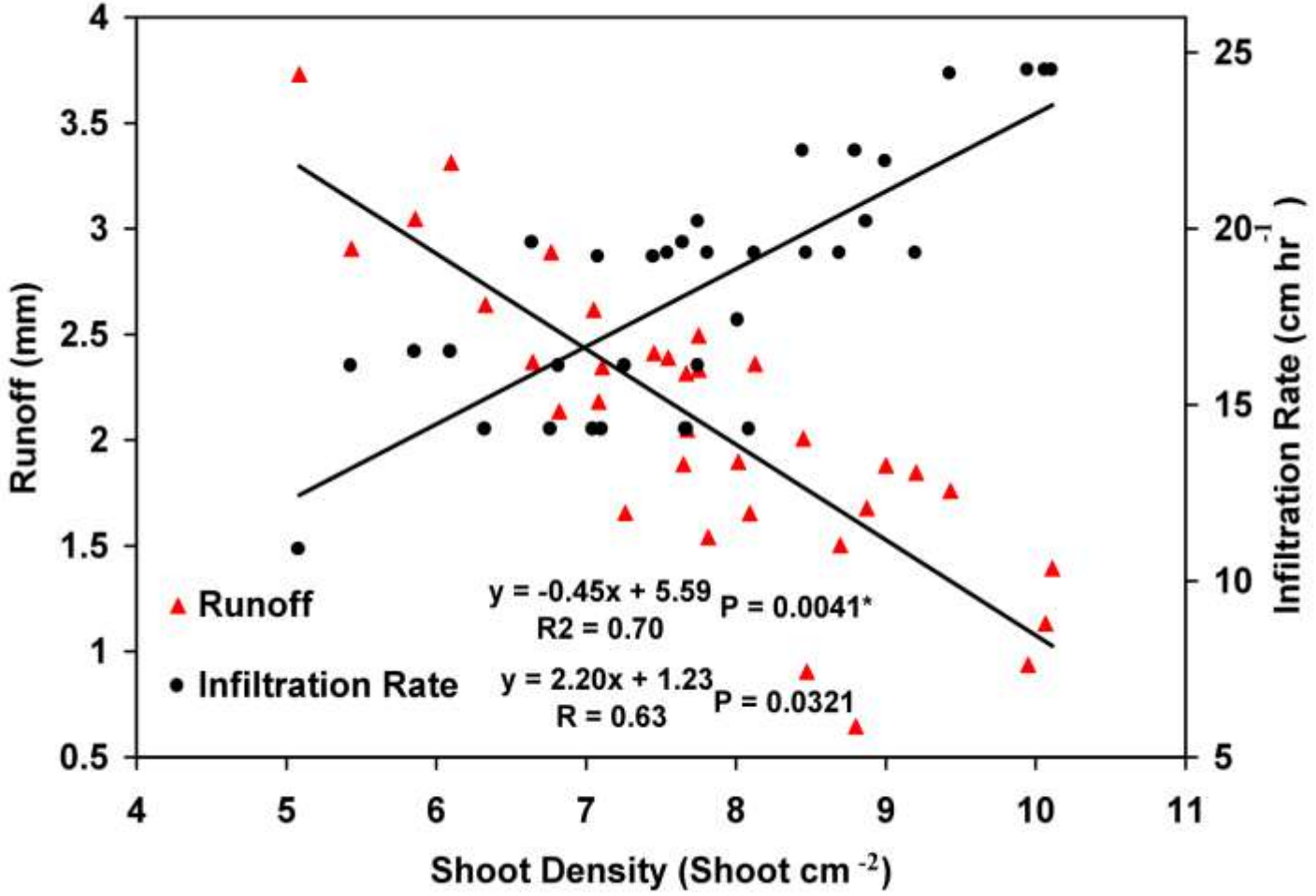
5-yr P fertilizer runoff study

- 86% of phosphorus runoff when soil was frozen.
- 78% of water runoff when soil was frozen.
- 72% of runoff P was water soluble
- Reduce P runoff by not applying P with high soil test P levels
- Properly fertilized turf can reduce runoff and P in runoff.



Significant Runoff Factors

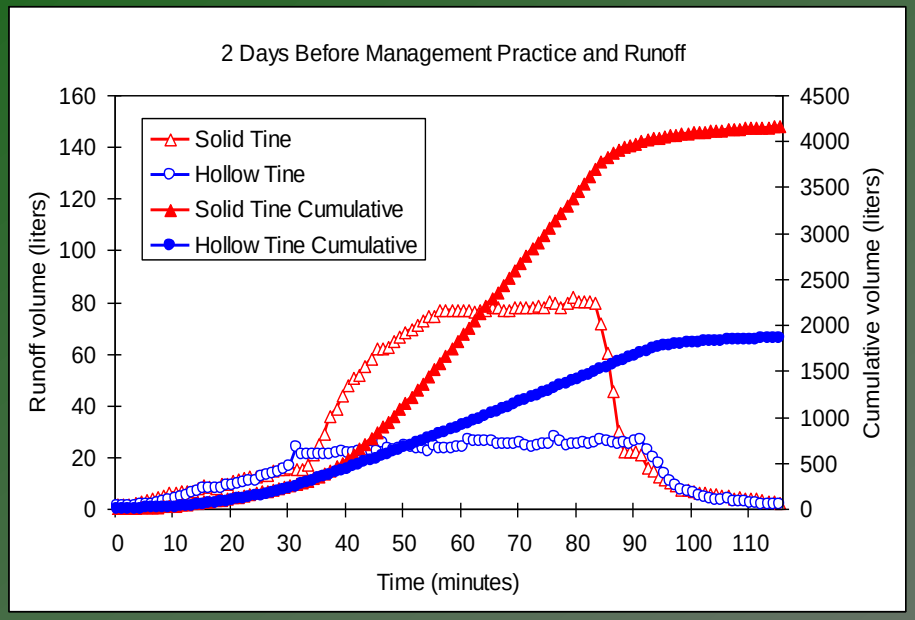
(Easton and Petrovic, 2004)

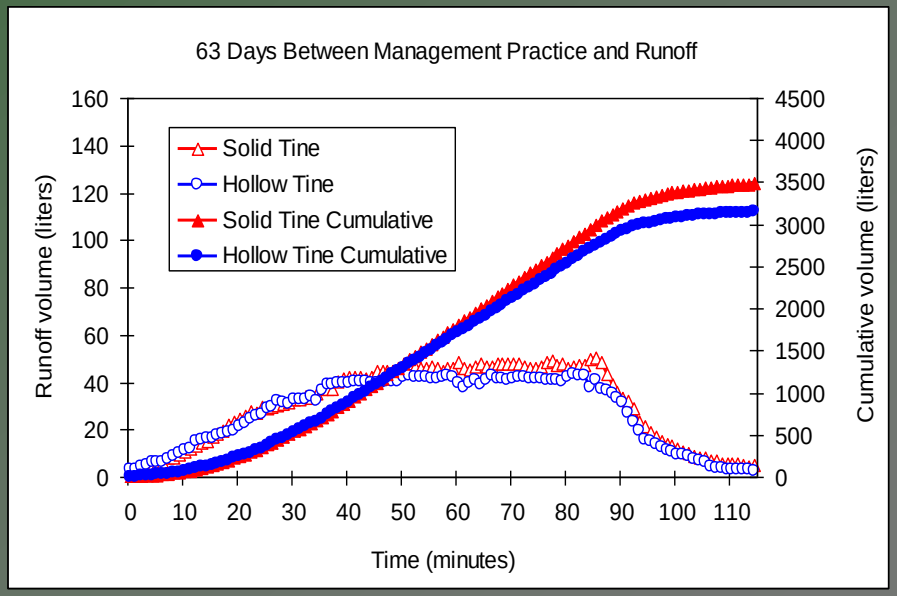


Hollow vs. Solid Tine Aerification

Bentgrass fairways

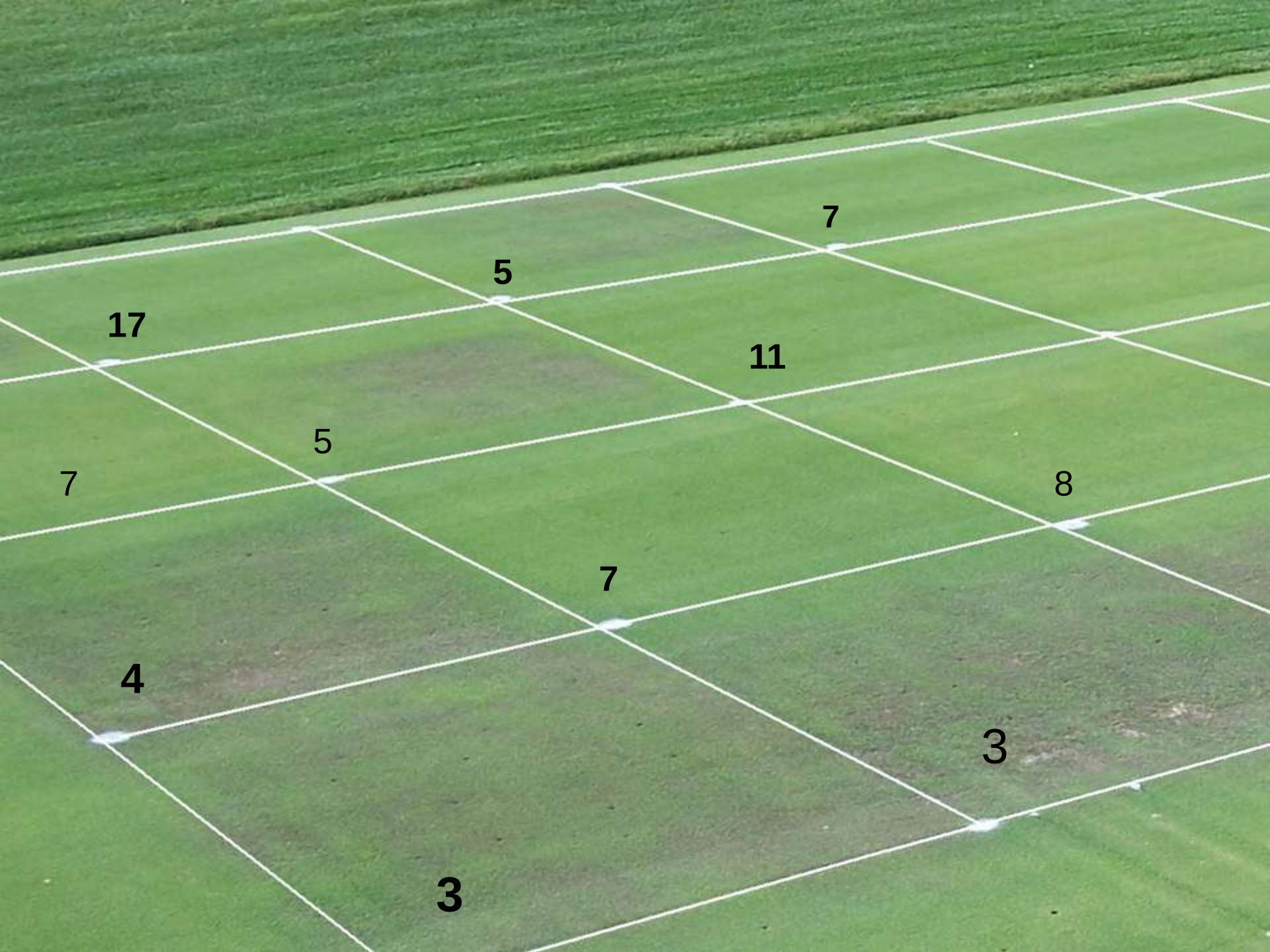
(2 and 63 days between aerification and runoff)





Runoff volume

- ➔ 55% reduction with hollow tine aerification (2 d)
- ➔ 10% reduction with hollow tine aerification (63 d)


7
5
17
11
5
7
8
7
4
3
3

Midwest P Lawn Fertilizer Laws Compared

(Year law passed / Year “zero-P” restriction implemented)

Midwest P Lawn Fertilizer Laws Compared

Aspect	Illinois	Michigan	Minnesota	Wisconsin
Year passed / enacted:	2010 / 2010	2010 / 2012	2002 / 2004	2009 / 2010
Administered by:	Dept of Ag	Dept of Ag	Dept of Ag	Dept of Ag
Applicators affected:	For hire	All	All	All
Exempted applicators:	Golf courses; Sod farms	Golf courses; Sod farms	Golf courses; Sod farms	Sod farms
When P lawn fertilizer can be applied:	Deficiency; Est. new turf; Lawn repair	Deficiency; Est. new turf	Deficiency; Est. turf	Deficiency; Est. turf
Exemption for types of manure or sewage sludge:	Yes	Yes	No	Yes
Application to paved surfaces: (All types of lawn fertilizer)	Prohibited, Clean up	Clean up	Prohibited, Clean up	Prohibited, Clean up

Midwest P Lawn Fertilizer Laws Compared

Aspect	Illinois	Michigan	Minnesota	Wisconsin
Setbacks from water: (All types of lawn fertilizer)	3 ft to 15 ft setback	3 ft to 15 ft setback	None	None
Restrictions on frozen and saturated soils: (All types of lawn fertilizer)	Not on frozen or saturated	Not on frozen or saturated	No restrictions	Not on frozen
Restrictions on P lawn fertilizer sales:	No restrictions	No restrictions	No restrictions	No display; No sale if ill intent known
Enforcement:	Dept of Ag; Atty General	Dept of Ag; Atty General	Local units of gov't	Dept of Ag
Penalty amounts:	$250 - $1,000	$50 - $1,000	Varies by local unit	$50 - $500
State needs to provide consumer information:	No requirement	Required	Required	No requirement

Wisconsin (NR-151)

- The application of lawn and garden fertilizers with pervious surface over 5 acres each, shall be done in accordance with a site specific nutrient application schedule based on appropriate soil tests. *The nutrient application schedule shall be designed to maintain the optimal health of the lawn or garden vegetation*. Consider use of slow-release fertilizers or spoon-feed nutrients to reduce NO_3 load to groundwater.

UW-Extension Response

- Affected: 500 golf courses, thousands of schools, hundreds of municipalities, countless private and commercial properties

- Developed instructional materials and resources for writing nutrient management plans

- Conducted nutrient management planning workshops around the state 2007-2009.
  - Trained at least 500 turf managers and dozens of consultants and sales staff who would go on to write plans for their customers

Conclusions

- Precedent setting (state-wide in MN; NR-151)
- Laws has been largely “self implementing” through education and altering type of product offered for sale.
- The law has effectively reduced amount of phosphorus sold in lawn fertilizers.
- MGCSA encouraged the law to demonstrate stewardship
- No changes in water quality due to MN law documented
- Benchmarked

MPCA photo


QUESTIONS

Recommendations

- Know phosphorus status in your state's lawns.
  If levels are low, passing zero-P law is not advised.
- Engage state ag agency, turf industry, and university specialists early in the process.
- Give manufacturers adequate lead time to clear out stock.
- Allow homeowners to use up old stock to avoid "weed & feed" from becoming hazardous waste.
- Require all lawn fertilizer to be cleaned up (not just P fertilizer).
- Don't promise a "silver bullet".

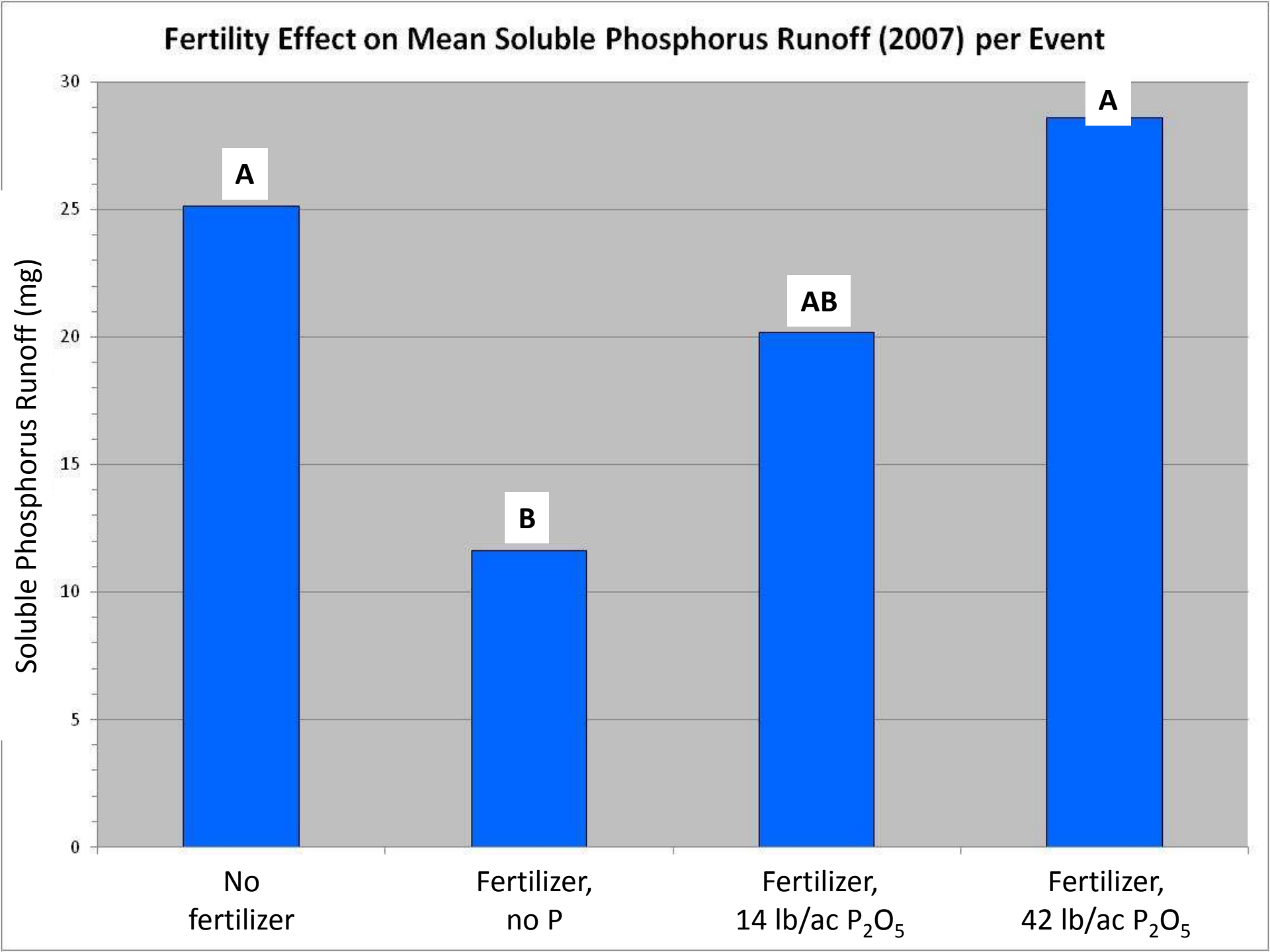
MDA photo

University of Minnesota turfgrass runoff study

Objective: Evaluate the effect of grass clipping management and fertilizer inputs on P runoff from home lawns.

Runoff collected during winter thaw.

Contact: Drs. Brian Horgan and Carl Rosen, University of Minnesota


Fertility Effect on Mean Soluble Phosphorus Runoff (2007) per Event
Soluble Phosphorus Runoff (mg)
30
25
20
15
10
5
0
A
B
AB
A
No fertilizer
Fertilizer, no P
Fertilizer, 14 lb/ac P_2O_5
Fertilizer, 42 lb/ac P_2O_5

The Minnesota law…

- Does not restrict the sale of P lawn fertilizer (display of product, need to show soil test, etc.).
- Does not exempt organic fertilizers.
- Defines "zero P" to be 0.67% P_2O_5 or less.
- Enforcement is delegated to local units of government.
- Requires consumer education, research evaluation and reporting.


YOUR LAWN AND THE ENVIRONMENT

Use phosphorus-free lawn fertilizer to protect Minnesota lakes and rivers

Minnesota law prohibits the application of phosphorus-containing fertilizer to lawns. Phosphorus is the primary nutrient that turns lakes and rivers green with algae.

Phosphorus Law

It is illegal to apply fertilizers containing phosphorus to lawns in Minnesota. Look for the middle number on a bag of fertilizer. It should be zero (0).

Exceptions

It's also illegal to spread any fertilizer on hard surfaces such as streets, sidewalks, and driveways. Rain can wash the fertilizer into nearby storm drains or road ditches, eventually getting into a lake or river near you. If you accidentally spill or spread fertilizer on a hard surface, clean it up immediately.

Will phosphorus-free fertilizer keep my lawn healthy?

THE PROBLEM: TOO GREEN

What do I look for?

22-0-15

The Minnesota law…

- Preempts regulation of all fertilizers by local units of government.
  (Local ordinances regulating the sale of P lawn fertilizer were grandfathered.)
- Did not provide funding.
- Did not promise but inferred cleaner lakes.

Education promoted "package approach":

- Use "zero P"
- Sweep up clippings
- Rake up leaves
- Pick up poop
- Control erosion

What can I do to protect water quality?

Fertilizers, leaves, grass clippings, animal waste, and eroded soil are all sources of phosphorus. When they are swept or washed into the street or nearest storm drain, they end up in your local lake or river. You can do your part to protect water quality by doing the following:

- Buy phosphorus-free lawn fertilizer.
- Apply fertilizer at the recommended rate. Late summer is the best time. Don't fertilize before a storm. Never apply to frozen ground.
- Keep soil, leaves, and lawn clippings out of the street.
- Mow higher. Keeping your grass length to 2½ – 3 inches is healthier for your lawn.
- Pick up pet waste promptly. Pet waste can contain harmful bacteria as well as nutrients that cause excess algae and weed growth in lakes and rivers.
- Control soil erosion around your house. When left bare, soil is easily washed away with rain, carrying phosphorus with it. Soil erosion can be prevented by keeping soil covered with vegetation or mulch.

Sweep it up: Grass clippings, leaves, or fertilizer left on streets and sidewalks can be a major source of phosphorus pollution in lakes and rivers.

How do I find out what my soil needs?

If you are concerned that your lawn

How did it work?

- Implementation went smoothly!
  - Legislative process provided awareness.
  - Local ordinances started the process.
  - Two-year lead time was provided.
- "Self-fulfilling" implementation:
  - Stores knew customers needed zero-P
  - Stores stocked zero-P
  - Customers bought and used zero-P
- Team approach to public education.
- Even with lead time, questions on using left-over P lawn fertilizer arose.

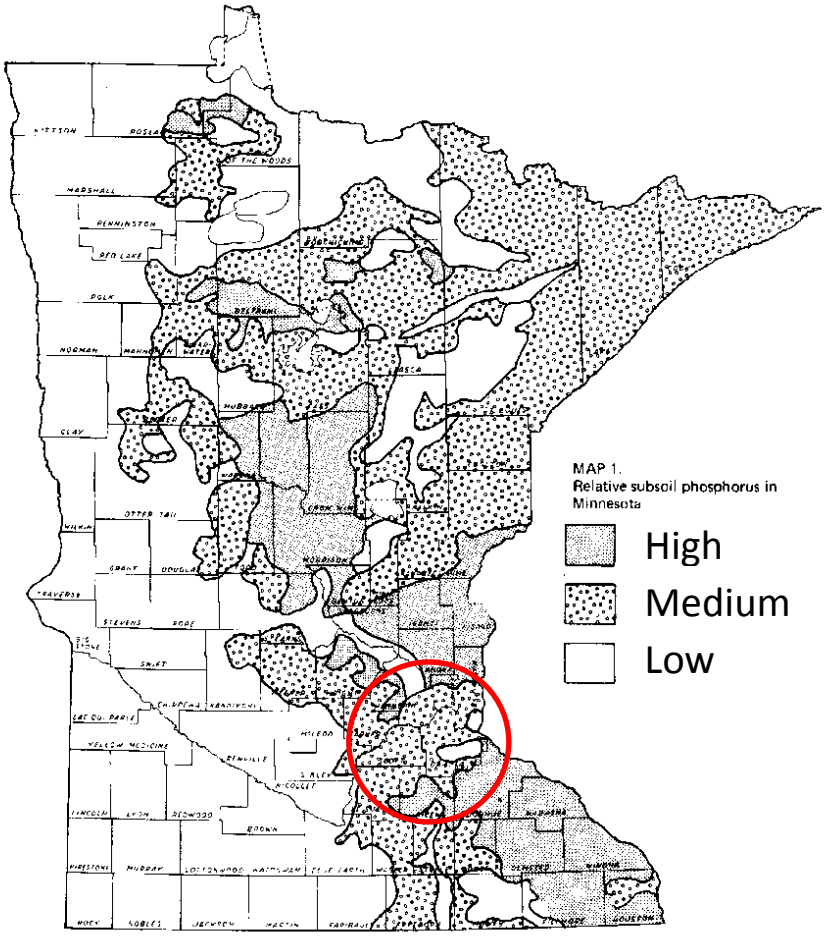
MPCA photo

Spring 2002


MENARDS® PREMIUM FERTILIZERS
Unconditionally Guaranteed!
Get National Brand Performance At Low MENARDS® Prices!
Phosphate Free!
Apply Early Spring
Apply To New Lawns
Apply Anytime!
Apply Late Spring
Phosphate Free!
Phosphate Free!
26-0-8 Premium Crabgrass Preventer
Sale 7.99
5,000 sq. ft. bag
Controls crabgrass, foxtail and other annual weed grasses. Greens up lawn and feeds up to two months. 535-1590
19-8-14 Premium Lawn Starter
Sale 9.99
10,000 sq. ft. bag
Formulated to stimulate early growth, thickening and green-up of seeded or sodded lawns. Feeds up to two months. 535-1615
30-0-5 Premium Lawn Food
Sale 10.99
10,000 sq. ft. bag
Timed release fertilizer promotes thick, deep green lawns. Special formula prevents surge growth and burning. Feeds up to two months. 535-1593
28-0-8 Premium Weed & Feed
Sale 12.99
10,000 sq. ft. bag
Trimec® herbicide controls dandelions and up to 200 broadleaf weeds. Greens up lawn and feeds up to two months. 535-1603

Factors in passage of the 2002 law

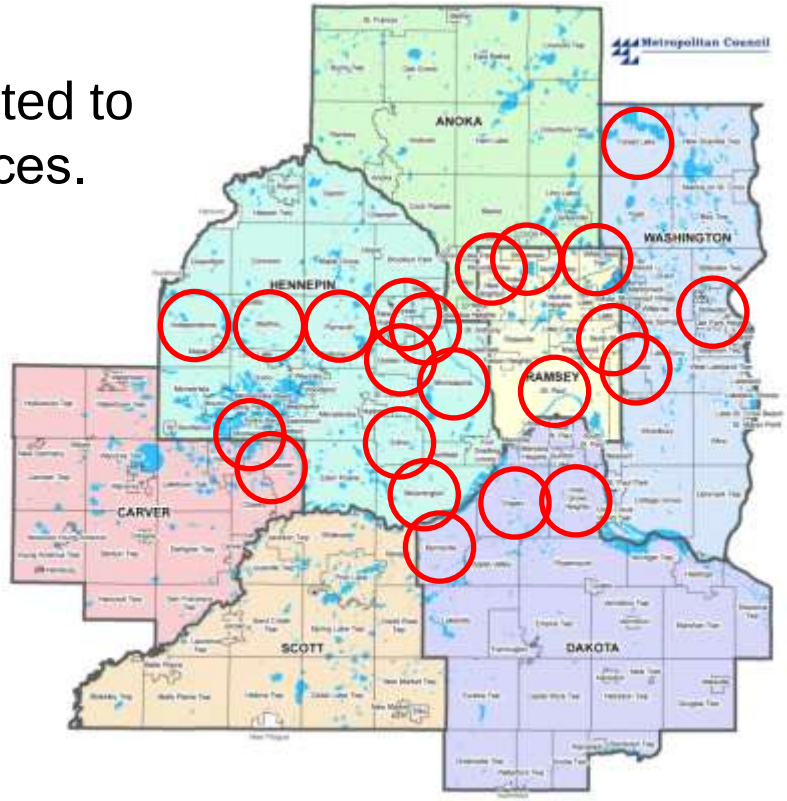
- Science based.
  - 1972-76 soil test survey showed 70 – 80% of Twin City lawns have soil P levels in “very high” range.
  - Subsequent 1991-94 soil test survey supported findings.
  - Based on “fertilize according to plant need” university recommendation long used by agriculture.
  - Subsequent expansion of law in 2004 to include entire state not supported by data.



Relative subsoil phosphorus in MN

Factors in passage of the 2002 law

- Coalition of city, landscape industry, and environmental interests.
  - Cities and landscape industry wanted to avoid “patchwork” of local ordinances.
  - Cities and environmental groups wanted to protect lakes.



Lawn fertilizer; a source of phosphorus

- Typically lawn fertilizer contains N-P-K, nitrogen, phosphorus, and potassium.
- It is nitrogen that “greens up” lawns.
- Phosphorus (P) content is expressed as phosphate (P_2O_5). (P_2O_5 X 43% = P)
- Maintenance lawn fertilizers have 3% P_2O_5, starter lawn fertilizers have 20% - 40% P_2O_5.
- A “zero in the middle” indicates a phosphorus-free fertilizer.
- Need for phosphorus-free lawn fertilizer noted in 1979 study.

MPCA photo

Phosphorus needed; not necessarily bad

- A major “life building block” (C, H, O, N, P, S).
- Fertilization should be based on plant need, ideally indicated by soil or tissue testing.
- Aquatic systems require 1,000 times less P than terrestrial systems – that is where problems start.

graysgardens.com

MPCA photo

For more information:

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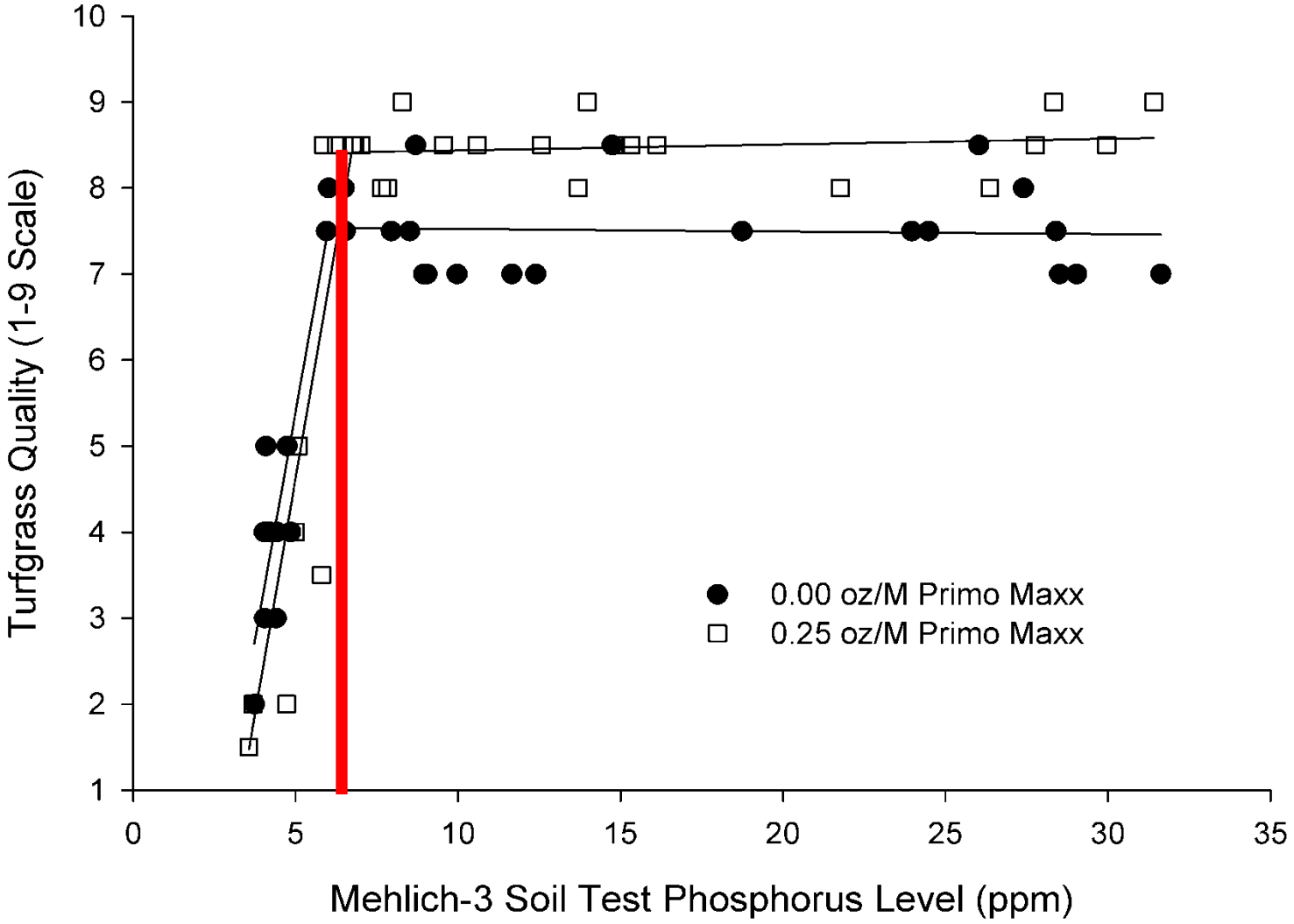
MINNESOTA DEPARTMENT OF AGRICULTURE

PESTICIDE AND FERTILIZER MANAGEMENT

Results: Turfgrass Quality and STP Level



Representative of All Months and Ratings
(Color, Yield, etc..) During all 16 Rating Months

Interests in MN Law

- The debate in MN dates back to early 1970's
  - Rosen, C.J. and B.P. Horgan. 2005. Regulation of phosphorus fertilizer application to turf in Minnesota: Historical perspective and opportunities for research and education. International Turfgrass Research Journal. 10:130-135.
- 6 manuscripts published
- 16 articles in trade magazines nationally
- 30 presentations made
  - 20 states
  - China
  - Europe
  - Scandinavia