UNIVERSITY OF MARYLAND
COLLEGE OF AGRICULTURE AND NATURAL RESOURCES

Role of Turf Fertilizer in Bay Nutrient Balance

Gary Felton

Water Quality Specialist

Environmental Science and Technology

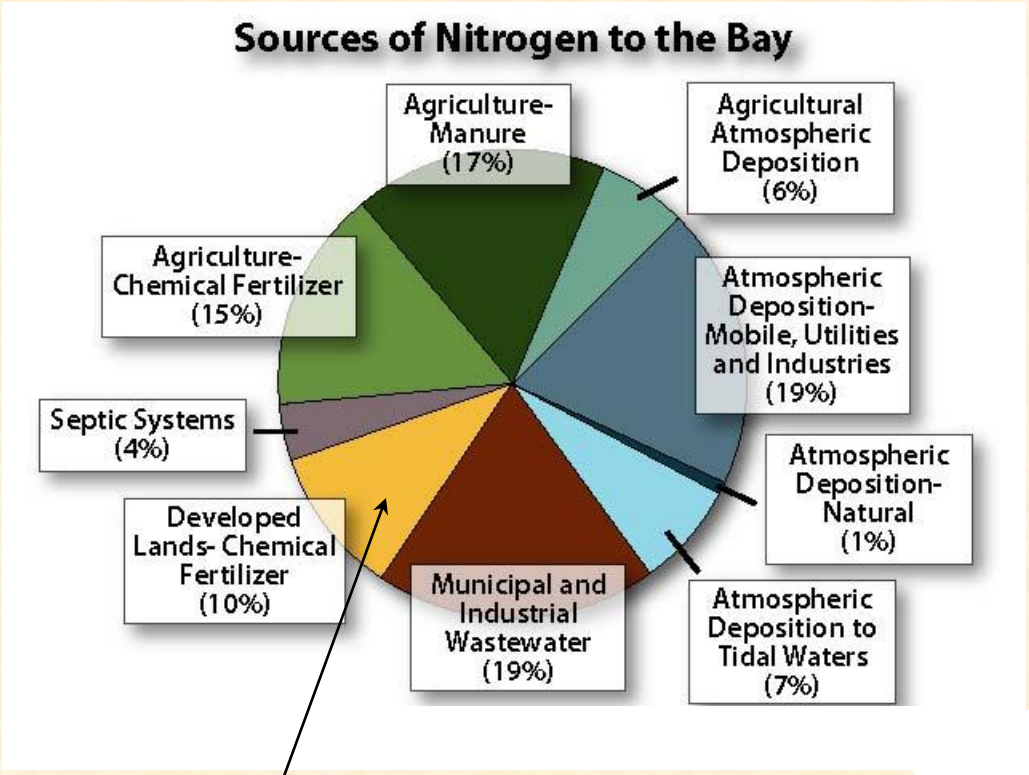
University of Maryland

UNIVERSITY OF MARYLAND EXTENSION

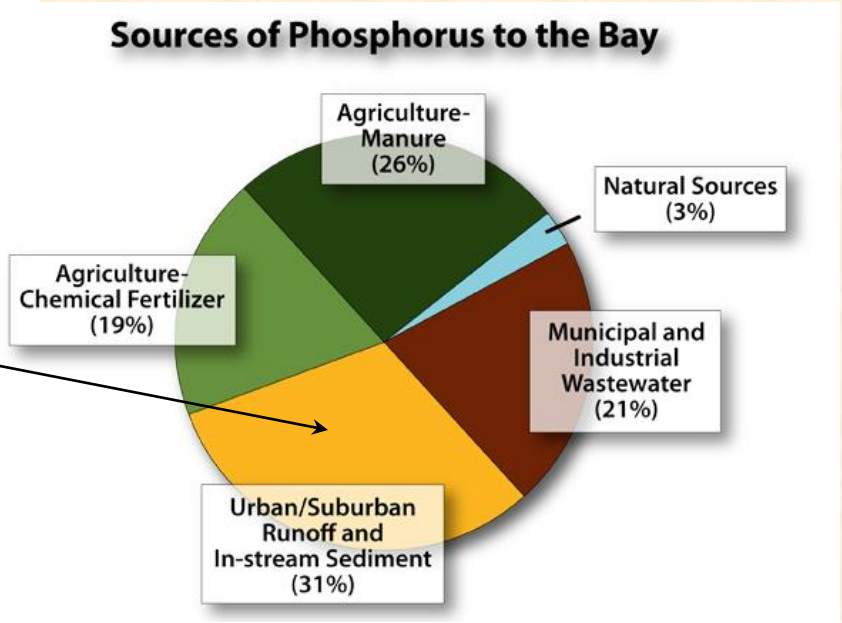
Solutions in your community

Overview

- Urban contribution to Bay nutrients
- Where does turf fit in?
- A little bit about turf
- A little bit about homeowners
- Nutrient loss studies
- What have we legislated?
- Where is there room for improvement?



Urban/Suburban



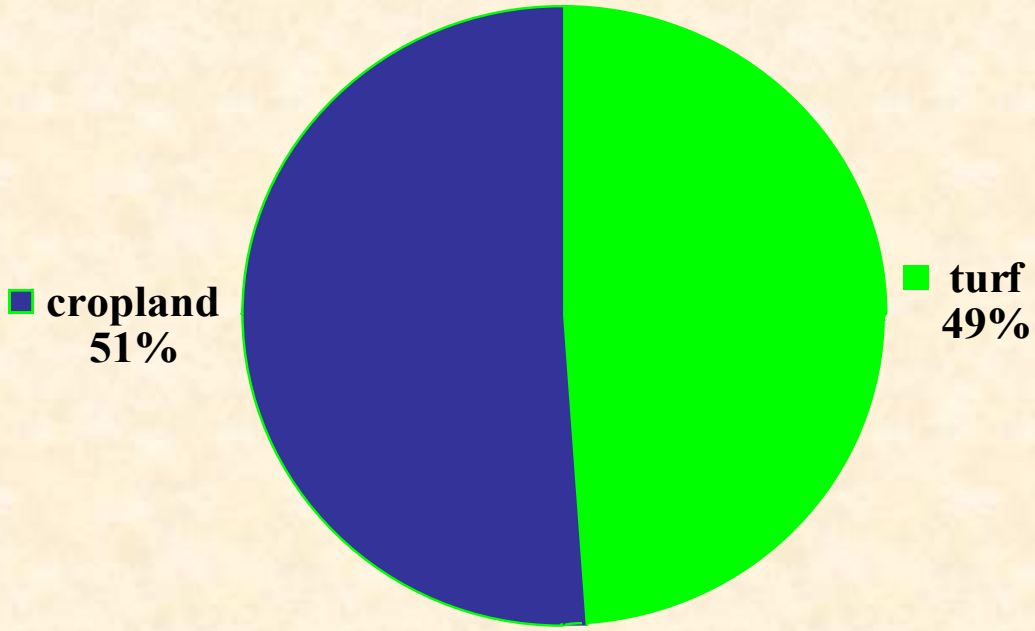
What's in the Urban slice of the pie?
(in addition to turf fertilizer)

- Air deposition
- Transportation [include our airports & trains]
- Construction [Sediment & P, not much N]
- Some septics
- Pet waste [we're a sink, just like we are for chickens]
- Plant waste A) leaves that fall on hard surfaces
- B) grass clippings on hard surfaces

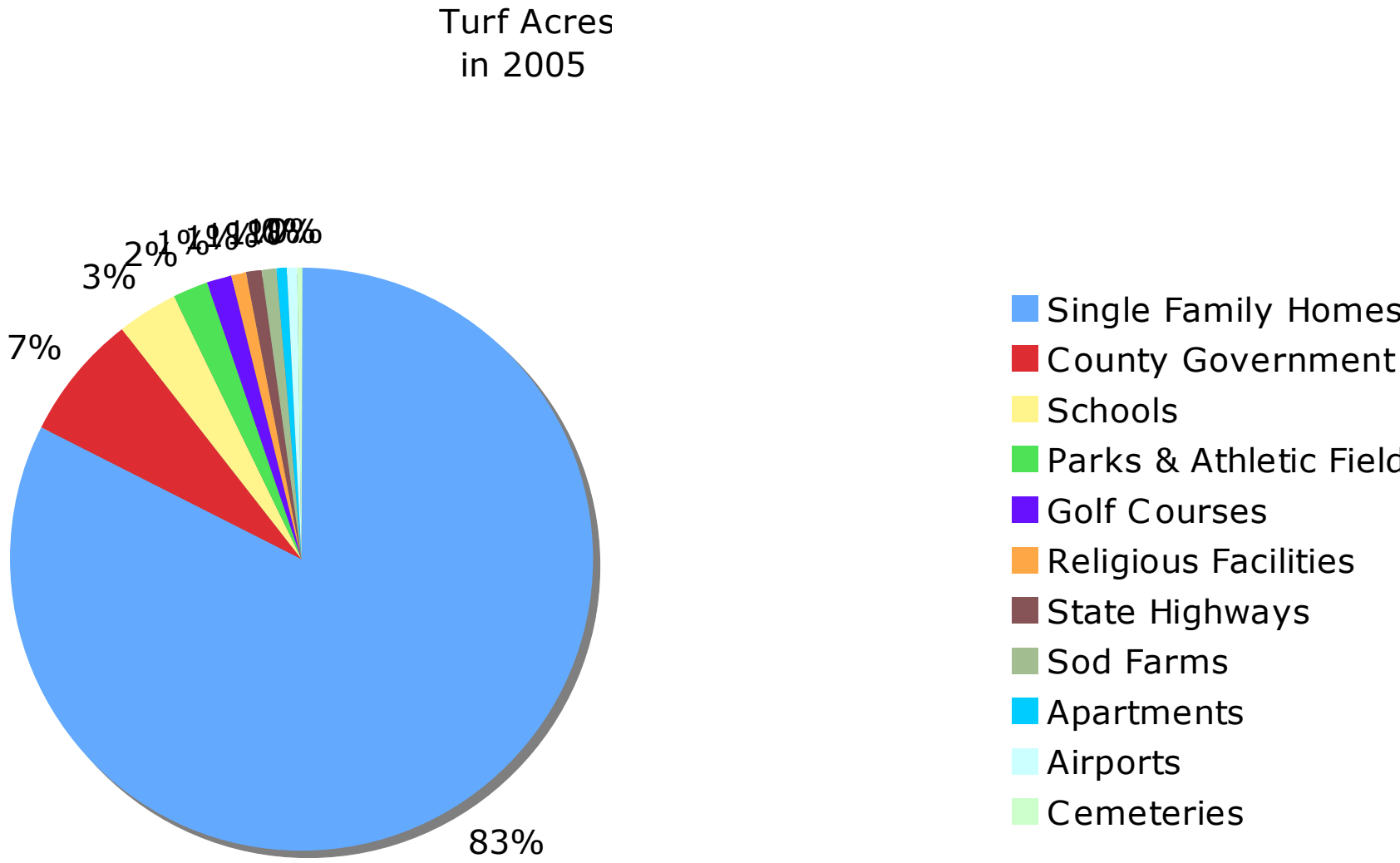
Overview

- Urban contribution to Bay nutrients
- Where does turf fit in?
- A little bit about turf
- A little bit about homeowners
- Nutrient loss studies
- What have we legislated?
- Where is there room for improvement?

Maryland
Land in Turf vs. Land in Crops



Maryland Turfgrass Survey Results



Maryland Turfgrass Survey

Sector	Turf Acres
Single Family Homes	936900
County Government	78200
Schools	38400
Parks & Athletic Fields	21800
Golf Courses	16400
Religious Facilities	9400
State Highways	9000
Sod Farms	8000
Apartments	7500
Airports	5000
Cemeteries	4200
Total	**1134800**

Bay Program SAYS:

(model run results)

County	Atmospheric Nitrogen (Lbs/Ac/Yr)	Fertilizer Nitrogen (Lbs/Ac/Yr)	Ratio
Alexandria	13.03	44.29	0.29
Arlington	14.07	46.18	0.30
D.C.	14.34	46.71	0.31
Fairfax	12.97	40.12	0.32
Fairfax City	13.81	45.6	0.30
Falls Church	14.17	41.96	0.34
Frederick	12.34	48.4	0.25
Loudoun	10.98	48.2	0.23
Manassas	10.98	48.2	0.23
Manassas Pk	12.42	47.52	0.26
Montgomery	12.68	45.06	0.28
P.G.	12.56	44.5	0.28
Prince Wm.	11.36	37.03	0.31

Air deposition = 14 lbs N/ac

14 lbs N/ac is 10% to 30% of turf need

Overview

- Urban contribution to Bay nutrients
- Where does turf fit in?
- A little bit about turf
- A little bit about homeowners
- Nutrient loss studies
- What have we legislated?
- Where is there room for improvement?

The University of Maryland Recommendations

N/year
(maintenance regime)

	lb N/ 1000 sq. ft.
Cool Season Grasses	
• Turf-type Tall Fescue	2.0-3.0
• Fine Fescue	0-2.0
• Bluegrass	3.0-4.0
Warm Season Grasses	
• Bermudagrass	3.0-4.0
• Zoysiagrass	0-2.0

Q: What are the UM recommendations based on?

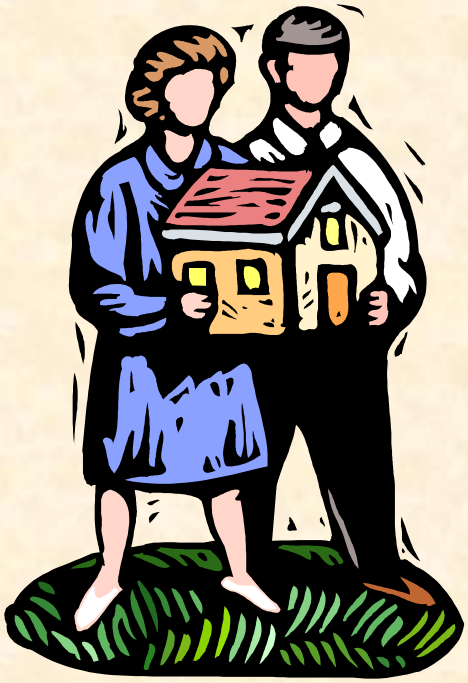
A: Doing everything wrong!

- Cut grass too low (3.5”)
- Remove clippings
- Water in summer
- Water incorrectly
- Poor soil

Overview

- Urban contribution to Bay nutrients
- Where does turf fit in?
- A little bit about turf
- A little bit about homeowners
- Nutrient loss studies
- What have we legislated?
- Where is there room for improvement?

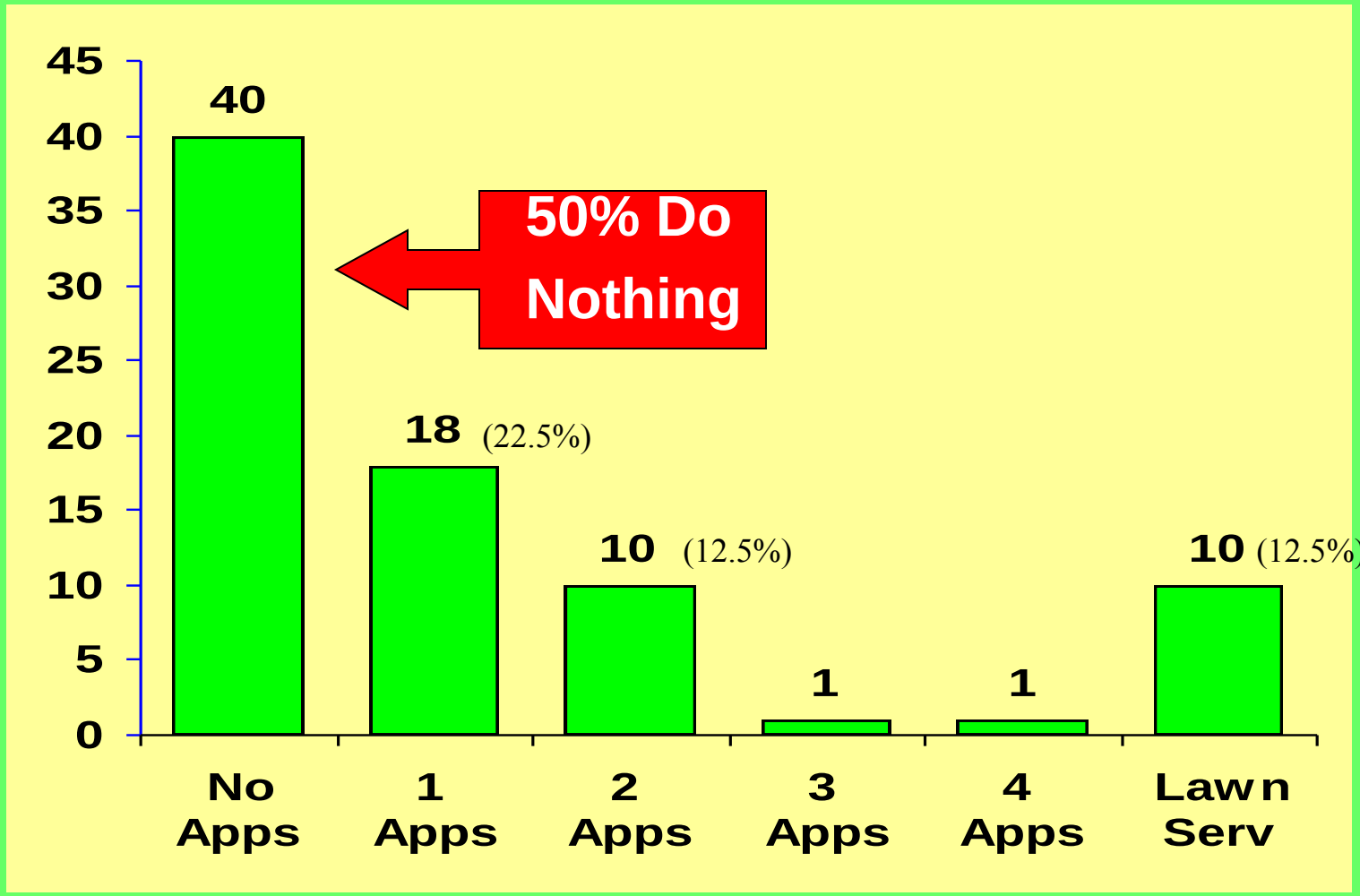
Homeowners or Single Residences in Maryland



- 5,286,000 Citizens
- 1,250,000 Estimated homeowners

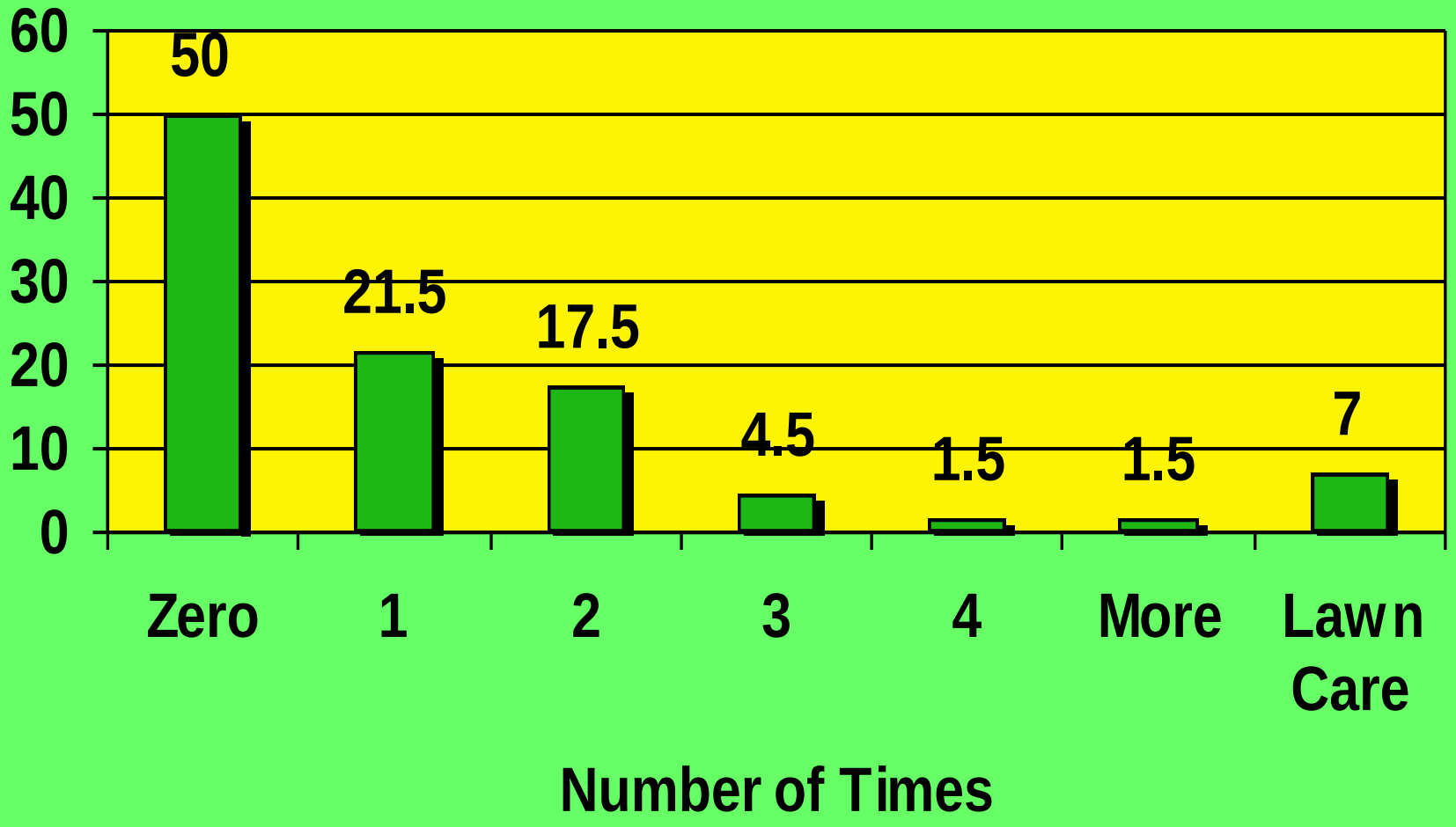
Nationwide DIY Home Lawn Care

Number of Home Lawns (millions)



Center for Watershed Protection Survey
1999

Number of Times/Year Fertilized



What We Know About "Suburban" Homeowners

- Approximately 33% of homeowners hire lawn care companies (in Central Md.)
- Approximately two-thirds of the remaining homeowners apply their own chemicals
- The remaining don't do anything.

Well just how much N is it???

- Using CWP distribution and estimates based on “typical” bag content at different times of the year,
- Average application is 0.96 lbs N/1000 sq ft
- Or 41.8 lbs N/ac

Overview

- Urban contribution to Bay nutrients
- Where does turf fit in?
- A little bit about turf
- A little bit about homeowners
- Nutrient loss studies
- What have we legislated?
- Where is there room for improvement?

More dense grass will reduce sediment loss better than less dense grass for high intensity storms.

For low intensity storms, any grass is much better than no grass.

Compaction reduces infiltration and can still be seen 12 years after turf establishment

Leaching losses occur from late fall through early spring. (Winter loss)

Nitrate leaching is reduced when slow release N source is part of fertility program.

Turf loses almost no N in runoff. If it loses N, it is lost through leaching.

Multiple applications (“spoon feeding”) greatly reduces leaching loss.

Early spring fertilizer application leads to leaching loss.

Slow release fertilizer greatly reduces leaching loss.

In a direct comparison of corn and turf, corn lost 70 kg NO_3-N/ha and turf lost 1.9-9.3 kg NO_3-N/ha (two years)

Why?

Turf has more biomass than silage corn

Turf grows from February to November (9-10 months) while corn grows from June to August (3-4 months)

Overview

- Urban contribution to Bay nutrients
- Where does turf fit in?
- A little bit about turf
- A little bit about homeowners
- Nutrient loss studies
- What have we legislated?
- Where is there room for improvement?

WQIA 1998, rev 2000

- Lawn care companies must take & use soil tests
- Lawn care companies must apply fertilizer according to UM recommendations

2009 Bill

- Manufacturers must report P sold in turf fertilizer in state
- Fertilizer with more than 5% P must
  - Be labeled “Not for Use on Lawns”
  - May not have spreader settings on bag
- Manufacturers must reduce P by 50% by 2010

Overview

- Urban contribution to Bay nutrients
- Where does turf fit in?
- A little bit about turf
- A little bit about homeowners
- Nutrient loss studies
- What have we legislated?
- Where is there room for improvement?

Fertilizer N needs can be reduced

- Leave clippings on turf (1.0 lb N/1000 sq ft)
- Cut grass high (reduces weeds up to 80%)
- Old is good! (1.0 lb N/1000 sq ft)
- Homeowners need education!

Best Management Tips:

- Keep fertilizer off paved surfaces

Spreader types count!

- Use a drop spreader instead of a rotary spreader in restricted spaces

Broadcast spreader

Drop spreader

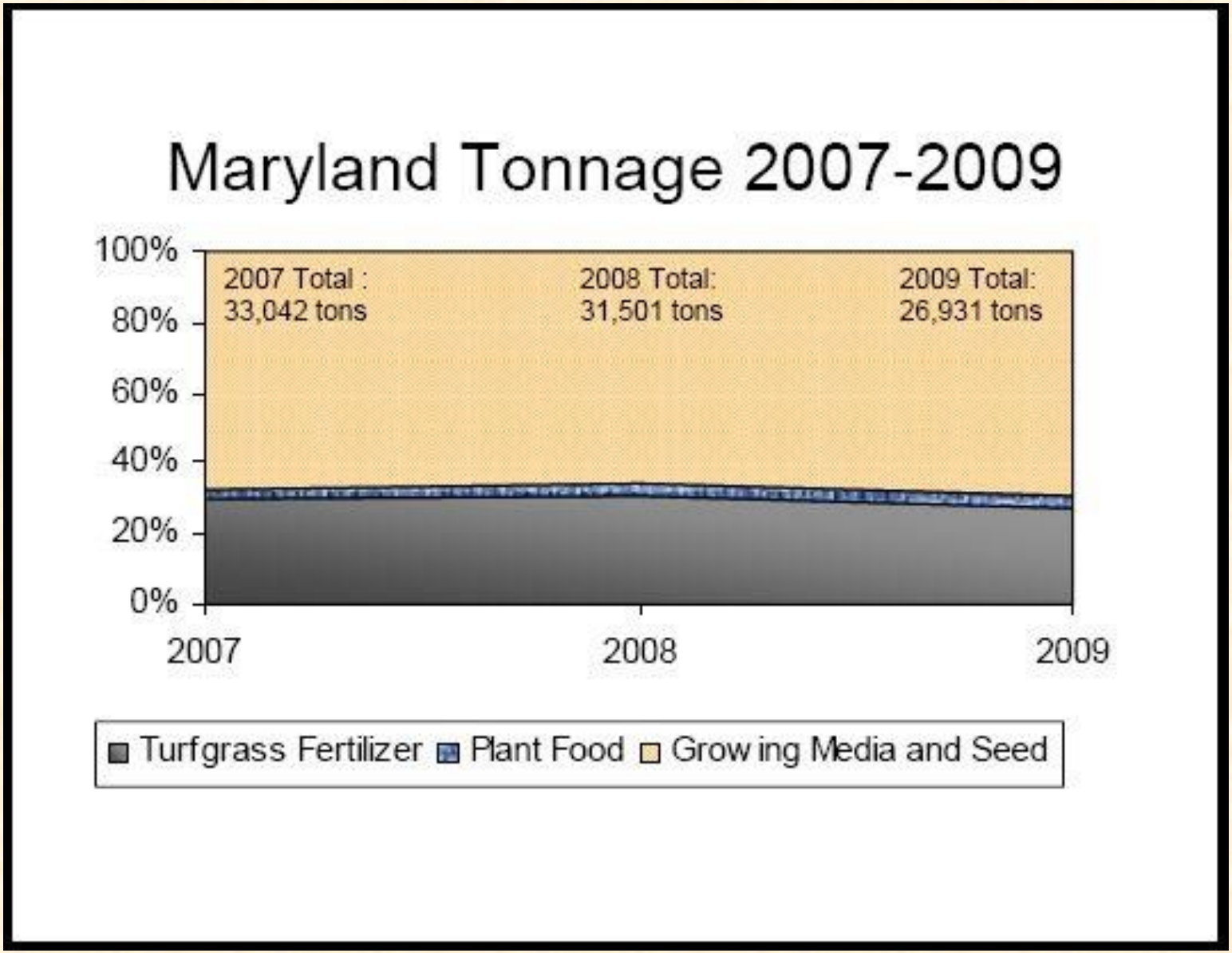

Easy On-Off Control
Lever Activates EdgeGuard®
Landscape Protection System
EdgeGuard® Protects Landscapes,
Driveways & Sidewalks
BROADCAST SPREADER
ESPARCIDOR DE SIEMBRA A VUELO
Edge Guard out of the way
Full broadcast spreader
Edge Guard rotated forward
Side discharge blocked

Nitrogen Loss from DIY Fertilizer in Maryland

Without Deflector Technology	**With Deflector Technology**
525,600 lbs N/year	85,329 lbs N/year
4% of applied DIY	0.65% of applied DIY

Scott's reports fertilizer sales to MDA

33,000 to 27,00 tons of fertilizer sold



TOTAL ... SUMMARY

From July, 2008 to December, 2008

FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES

Reporting Content

	CONTAINER				USE						
	TOTAL	Bag	Bulk	Liquid	Farm	N-Farm Total	N-Farm Lawn Turf	N-Farm Golf-Athl	N-Farm Garden	N-Farm Pot/PeatSoil	N-Farm GH-Nursery
MULTI-NUTRIENT	375,758.03	78,377.16	242,778.10	58,590.58	206,580.75	69,205.37	24,672.55	14,160.58	8,450.73	13,374.55	9,195.96
NITROGEN	53,106.72	2,975.20	22,424.86	27,808.67	47,627.31	5,626.41	2,155.20	2,690.57	407.25	2.20	371.72
PHOSPHATE	304.20	146.26	118.71	64.92	276.45	76.56	20.00	5.50	24.50	0.00	25.02
POTASH	21,121.27	2,580.56	18,191.47	340.46	15,161.15	7,870.16	6,196.90	672.21	720.36	12.26	177.78
ORGANICS	32,313.87	13,772.06	18,397.12	0.00	17,935.37	14,353.16	506.03	800.18	13,207.97	100.00	0.00
SECOND/MICRO	139,764.57	5,805.55	130,053.50	4,255.90	137,137.94	2,626.61	780.74	905.44	425.77	414.60	97.30
LIME	148,850.51	3,300.25	146,220.56	0.00	143,296.31	5,753.20	5,046.42	273.15	150.62	0.00	225.00
MISCELLANEOUS	3,766.73	2,239.63	473.70	608.42	1,232.39	2,346.74	254.52	64.35	3.50	1,030.77	205.90
TOTAL	755,162.64	108,356.79	578,044.81	68,063.12	546,112.40	157,701.16	39,128.01	19,368.29	23,026.03	15,580.48	10,517.34

<u>Reporting Container:</u>

Bag, Bulk, Liquid

<u>Reporting Use:</u>

Farm, Non-Farm

Turf, Golf-Athletic Filed, Garden

Potting Soil, Nursery

QUESTIONS

UNIVERSITY OF
MARYLAND

MARYLAND COOPERATIVE EXTENSION
COLLEGE OF AGRICULTURE AND NATURAL RESOURCES

Gary K. Felton, Ph.D.
Associate Professor
Extension Agriculture Engineer

College Park, Maryland 20742-2315

301.405.8039 TEL 301.314.9023 FAX
gfelton@umd.edu