

Turfgrass Management BMP's

Sussex County Conservation District

October 2021

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UD Cooperative Extension

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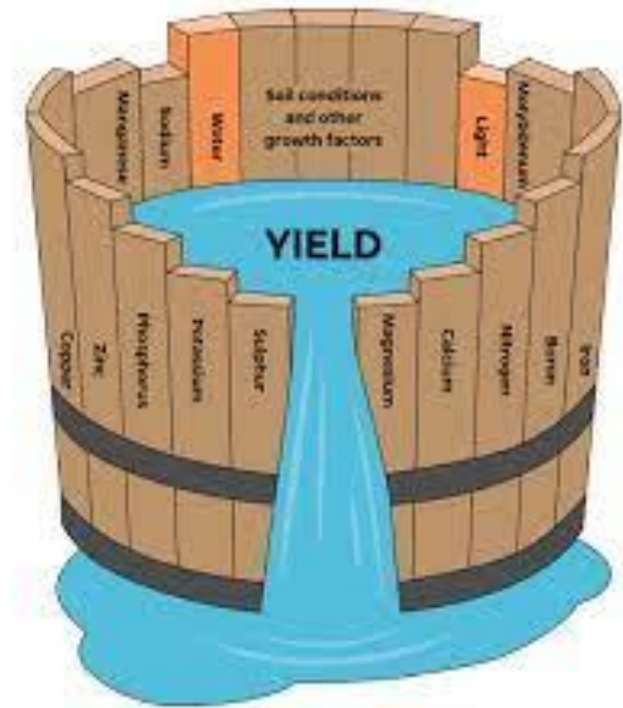
Topics

1. The 4 R's of Fertilizer
2. Soil Amendments
3. Water Management
4. Fall Army Worm IPM

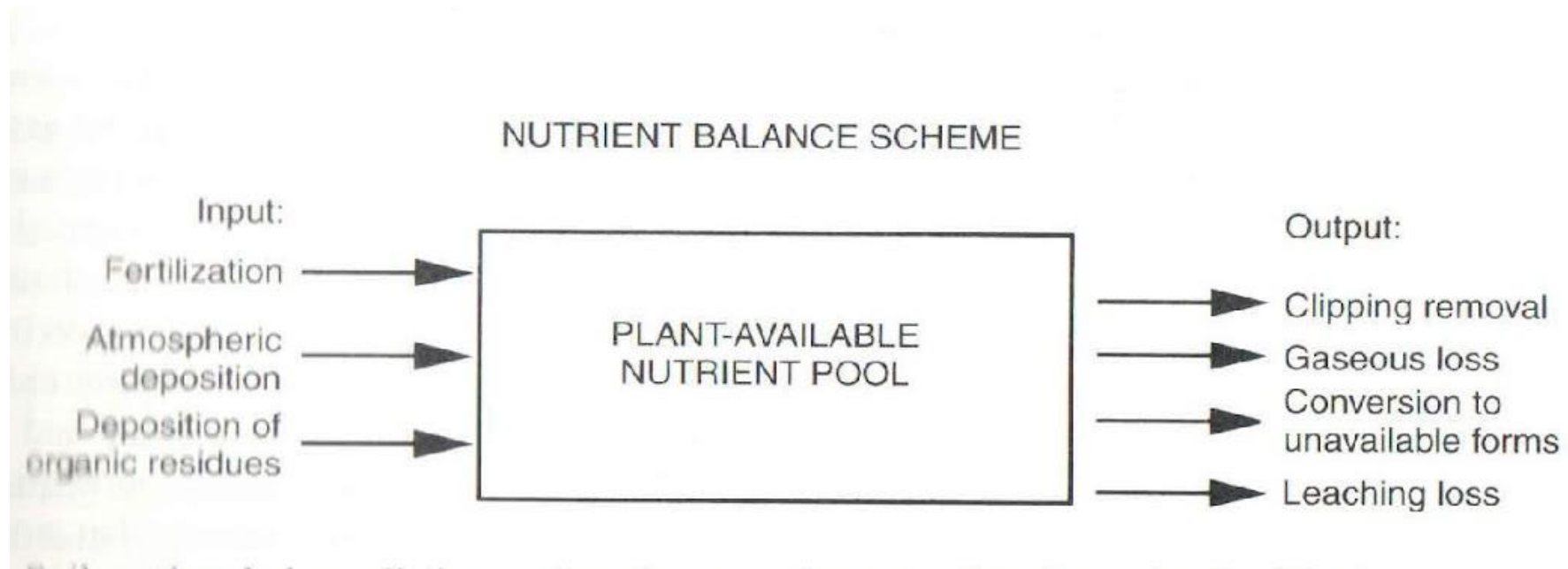
Turfgrass management- "Utilization of grasses while implementing the necessary management practices to control growth in order to achieve a desired surface"

Fertilization

- Adding of nutrients that are not supplied by the soil
- Macro-Primary – N, P, K,*O, H, C
- Macro-Secondary – S, Ca, Mg
- Micro- Fe, Mn, B, Cu, Z, Mo, Cl
- Avoid deficiencies with fertilizers
- Soil testing

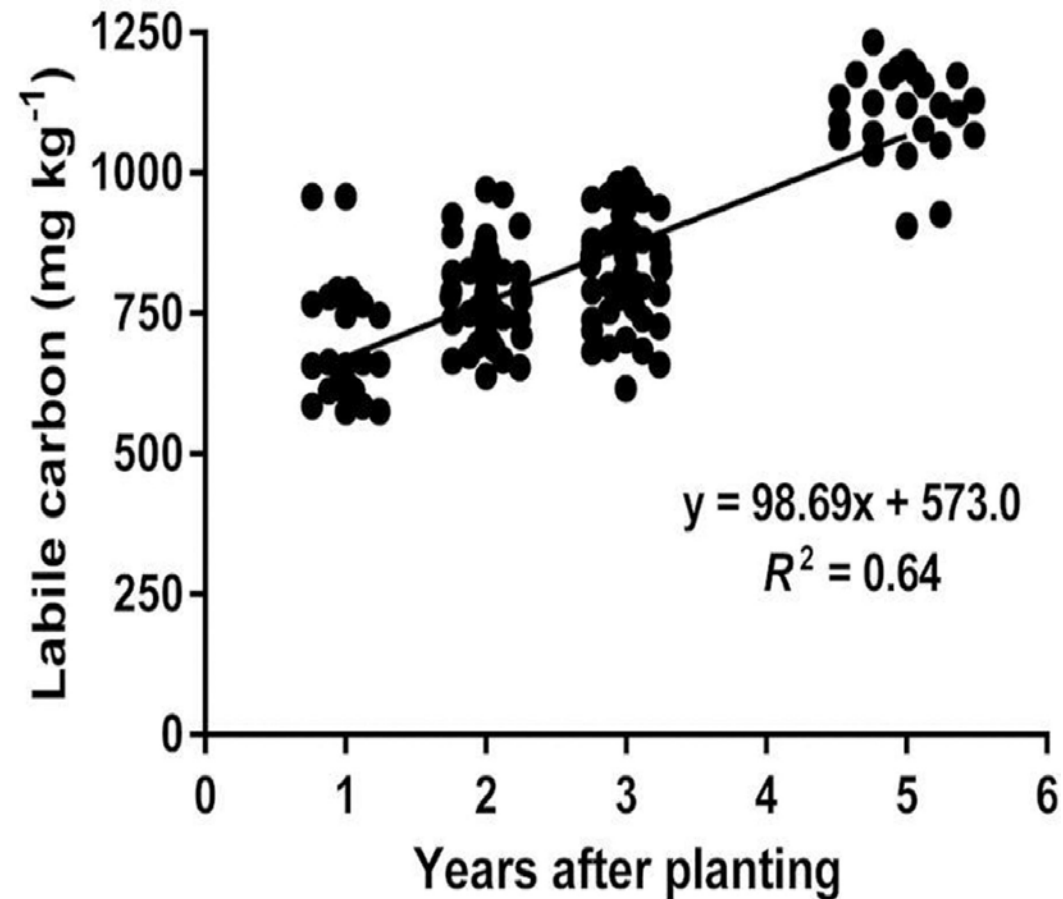


Nutrients In & Out



Clipping Management

- Clippings should always be returned
- Clippings are fertilizer
- Can supply 30%+ of yearly N needs
- Collecting clippings is a waste of nutrients and organic materials
- C sequestration linearly over time
- Organic matter
- Impervious surfaces



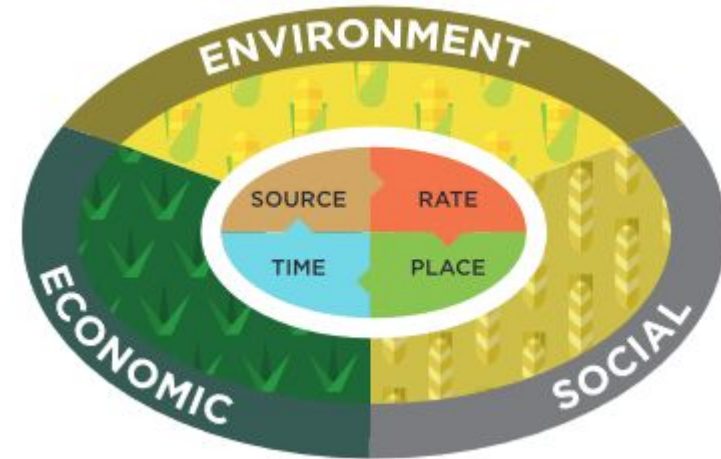
Don't Do This



The 4 R's Of Fertilization

1. Right place
2. Right rate
3. Right source
4. Right time

- Applying nutrients the plant doesn't need is wasteful



Spreaders

- Always calibrate your spreader when switching products



Right Place

- Apply only to the intended target
- Keep away from water sources
- Clean impervious surfaces



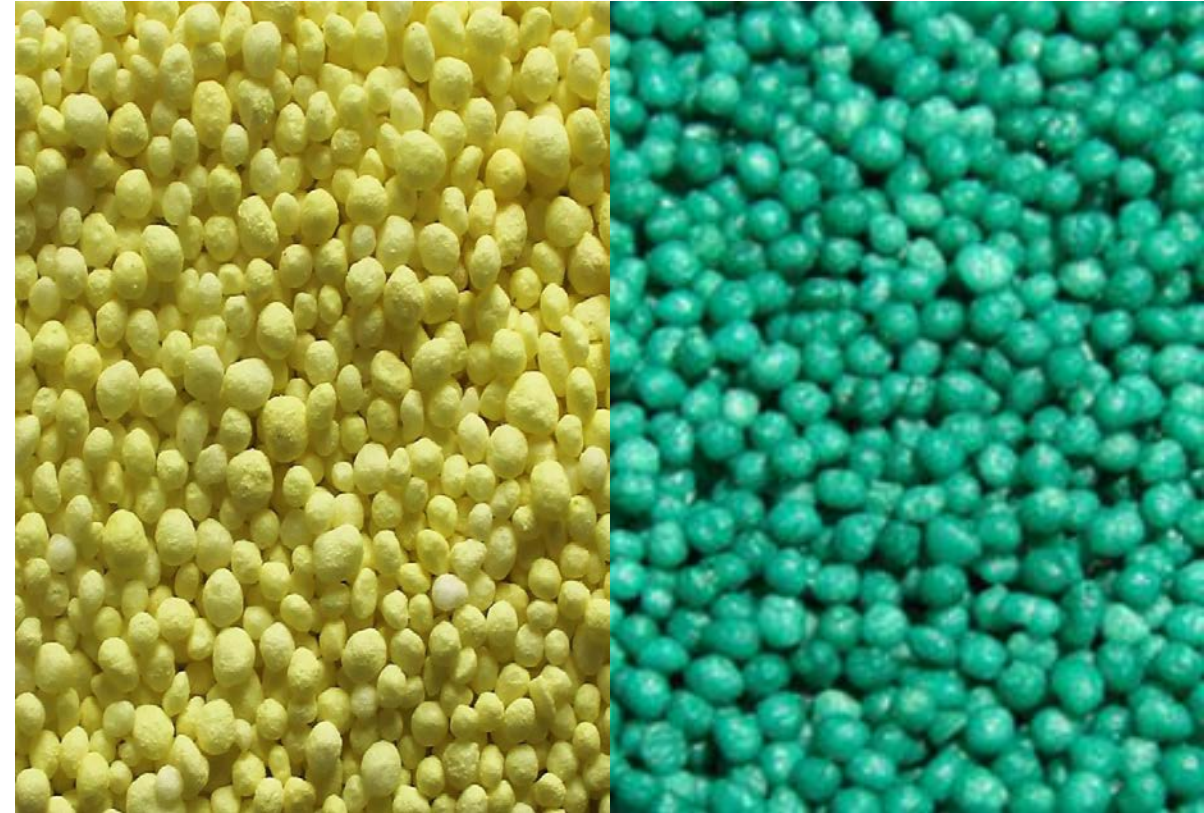
Right Rate

- Apply only what it is needed based on soil test
- Too much or too little can have major consequences
 - Succulency
 - Nutrient deficiency



Right Source

- Use of slow-release fertilizers when possible (35%>)
- Using reputable companies
- Water soluble use needs precaution
- ALWAYS irrigate after water soluble applications

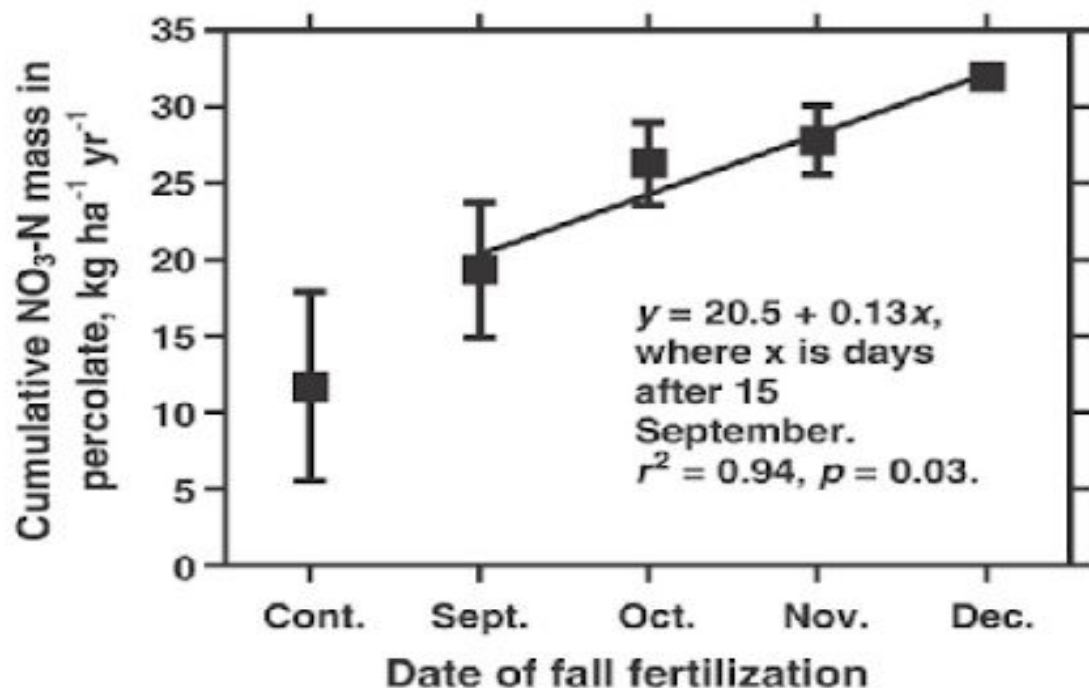


Right Time

- Pay attention to weather
- Understand the growing season of your turf
- November is too late!!!



Fall Fertilization & N Loss Potential

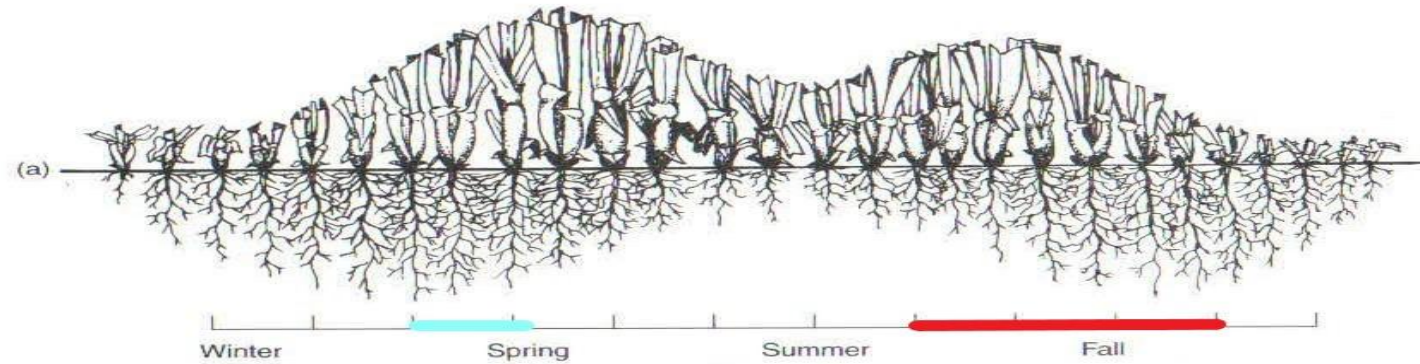


Treatment	Applied fall N mass collected in percolate [†]		
	Year 1	Year 2	Both years
	%		
15 Sept.	2.0	29.1	15.5
15 Oct.	3.1	56.4	29.8
15 Nov.	1.6	64.2	32.9
15 Dec.	16.8	66.1	41.4

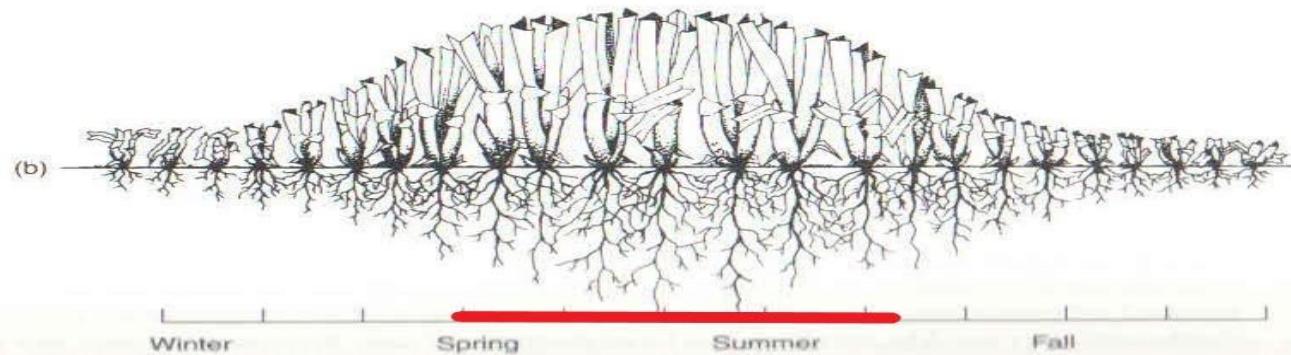
[†] Percent lost = (mean N in percolate for treatment - mean N in percolate for control)/(fall N applied) \times 100%.

General Growth Cycles

C3-Cool season



C4-Warm season

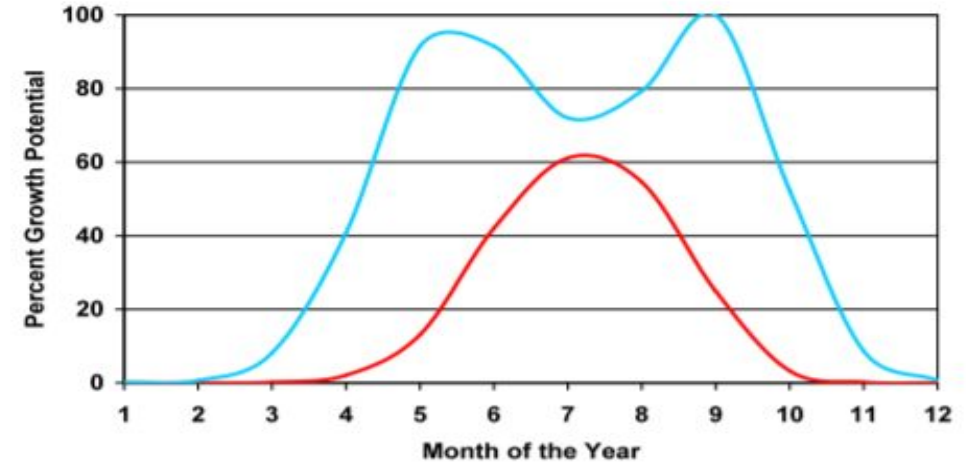
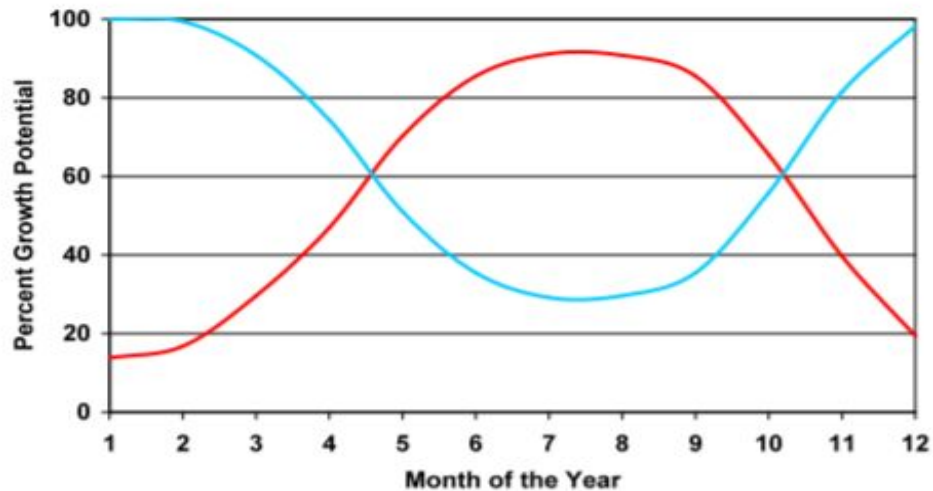


Turfgrass Growth Potential

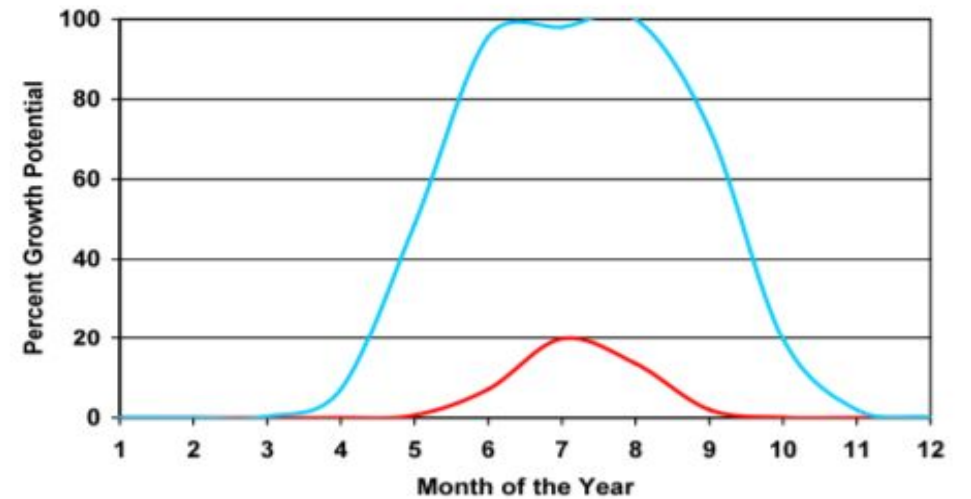
Ideal Temperatures

- 65-75 for cool season grasses
- 82+ for warm season grasses
- Growth does not decline as temperatures increase

Miami, FL



Worcester, MA



Organic Soil Amendments



Grass clippings, composts, manures, wood chips, bio-solids etc.

- Decompose over time
- Plant nutrient source
- Mitigate poor quality soils – chemical and physical – urban areas

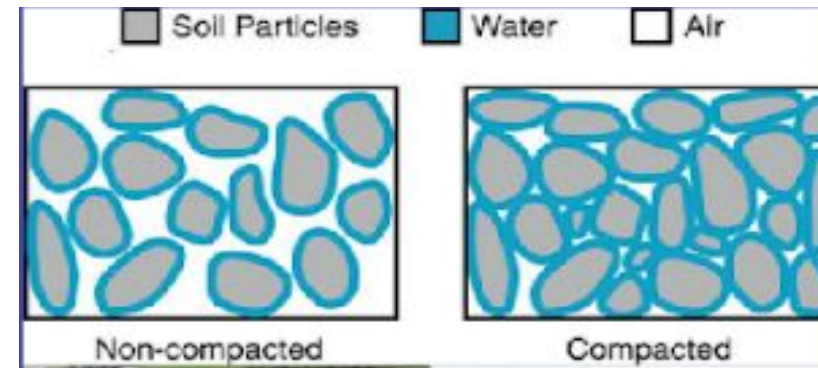
Benefits Of Compost

Increase

- CEC
- pH
- C & N cycling
- Aeration
- Drainage
- Establishment
- Structure

Decrease

- Bulk density - compaction



Compaction Symptoms

- Turf/plant quality decline
- Nutrient deficiencies
- Easily drought stressed
- Lateral root growth
- Easily ponding of water
- Fast thatch accumulations



General Guide For Compost Quality

- C:N 30:1 or less
- 30-50% moisture content
- OM 30% or greater
- Ash content 70% or less
- Metals – locally/federally mandated ranges
- Soluble salts
- N 0.5-3.0 %
- P 0.2% - lower P is best



Analysis Sheet



US Composting Council
Seal of Testing Assurance®

Account No. : 2421

STA Compost (TMECC) Analysis Report

BIOENERGY DEVELOPMENT COMPANY
DBA BIOENERGY INNOVATION CENTE
28338 ENVIRO WAY
SEAFORD DE 19973

Invoice No. : 1121261
Date Received : 07/28/2020
Date Analyzed : 07/30/2020

Lab No. : 11615

Results For : 01292019
Sample ID : 01292019

	Analysis Dry Basis	Analysis As Is Basis	Lbs / Ton		Available First Year
			Dry Basis	As Is Basis	
Organic N, % N	1.99	1.29	39.8	25.8	6.5
Ammonium, % N	0.123	0.0800	2.5	1.6	1.5
Nitrate, % N	0.028	0.0180	0.6	0.4	0.4
Total N, % N	2.14	1.39	42.8	27.8	8.3
Phosphorus, % P ₂ O ₅	2.98	1.93	59.6	38.7	27.1
Potassium, % K ₂ O	0.64	0.42	12.8	8.3	7.5
Sulfur, % S	0.47	0.31	9.5	6.1	2.5
Calcium, % Ca	11.56	7.50	231.2	150.1	105.1
Magnesium, % Mg	0.51	0.33	10.3	6.7	4.7
Sodium, % Na	0.18	0.12	3.6	2.3	2.3
Sodium Adsorption Ratio (SAR)	1.40				
Zinc, ppm Zn	187.0	121.4	0.4	0.2	0.2
Iron, ppm Fe	18379.5	11928.3	36.8	23.9	16.7
Manganese, ppm Mn	262.6	170.4	0.5	0.3	0.2
Copper, ppm Cu	90.9	59.0	0.2	0.1	0.1
Aluminum, ppm Al	7092.2	4602.8	14.2	9.2	6.4
Boron, ppm B	37.7	24.5	0.1	0.0	0.0
Soluble Salts, (EC 1:5) dS/m		3.66			
pH		7.9			
Moisture, %	35.10				
Dry Matter (TS), %	64.90				
Ash, %	57.78	37.50			
Organic Matter LOI 550C, %	42.22	27.40			
Organic Carbon, %	24.49	15.89			
Organic C:N Ratio	11.4				
Bulk Density, lbs / cubic foot		34			

W.R. Rohrer - AgroLab Inc.

8/14/2020

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101 Clukey Dr.
Harrington, DE 19952

Site Preparation

- Soil test prior to establishment
- Rocks, construction materials, and other debris need to be removed
- Add topsoil where needed
 - 6" of quality soil is the minimum
- Grade soil for proper surface drainage
- Smooth to fill low areas



Compost Application Methods For Established Turf

- Increase surface smoothness



Well, How Much?

	Inches of compost applied				
	Surface Application	Tilled into soil			
Unit area in square feet	¼	½	1	1½	2
1,000	1*	2	3	5	6
5,000	4	8	15	23	31
10,000	8	15	31	46	62
20,000	15	31	62	93	123
30,000	23	43	93	139	185
40,000	31	62	123	185	247
* amounts of compost in cubic yards rounded to nearest whole numbers.					

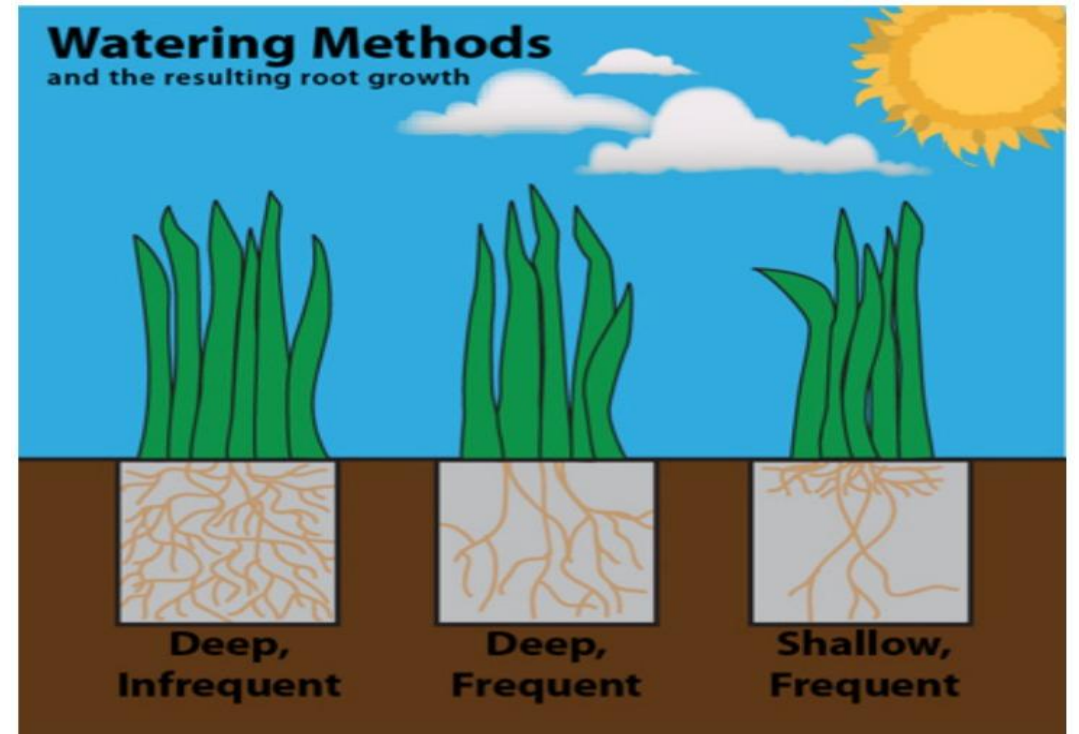
How Long

- Studies have shown that effects can remain for 5 years or more
- Decomposition depends on C:N, temperature, and moisture
- Yearly applications not a BMP



Water Management

- Supplemental irrigation should be viewed as a way to alleviate drought stress
- Deep and infrequent is a BMP
- Deep and frequent causes anaerobic soils, fungal pathogens, and root dieback
- Shallow and frequent = easy drought stress



Soil Drying

1020

CROP SCIENCE, VOL. 38, JULY–AUGUST 1998

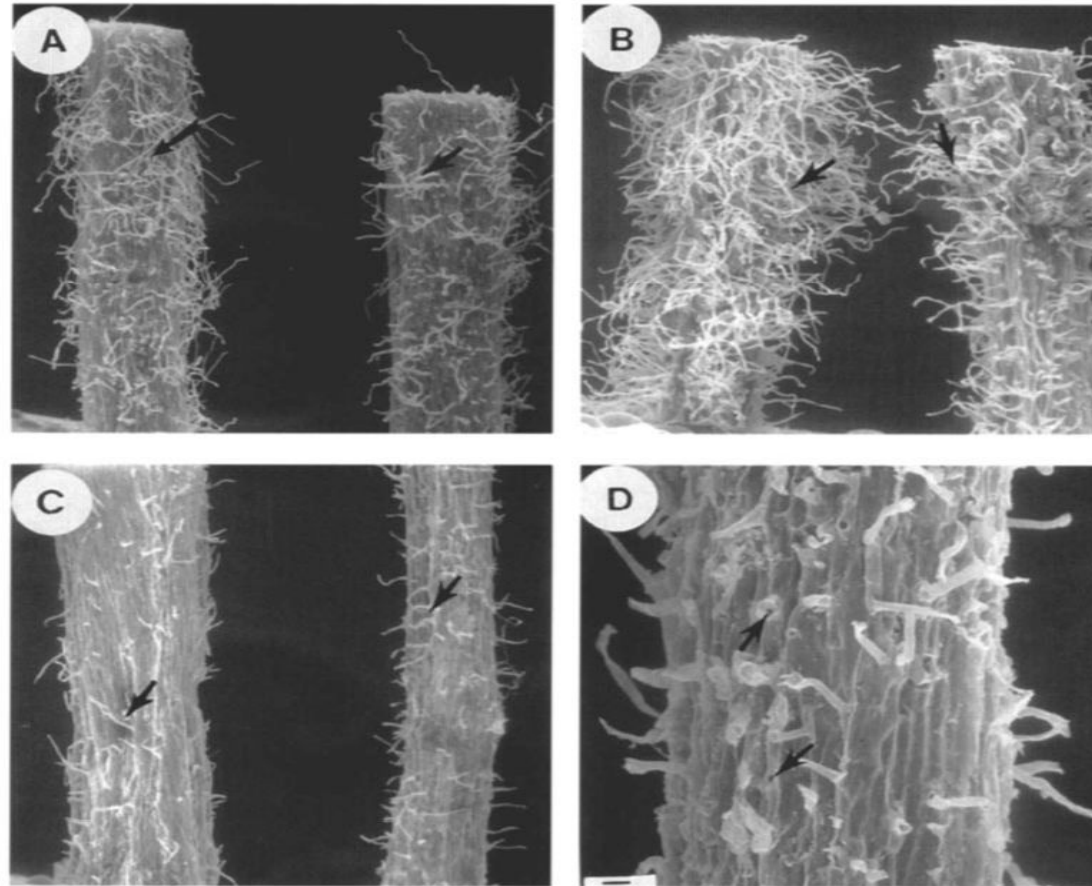
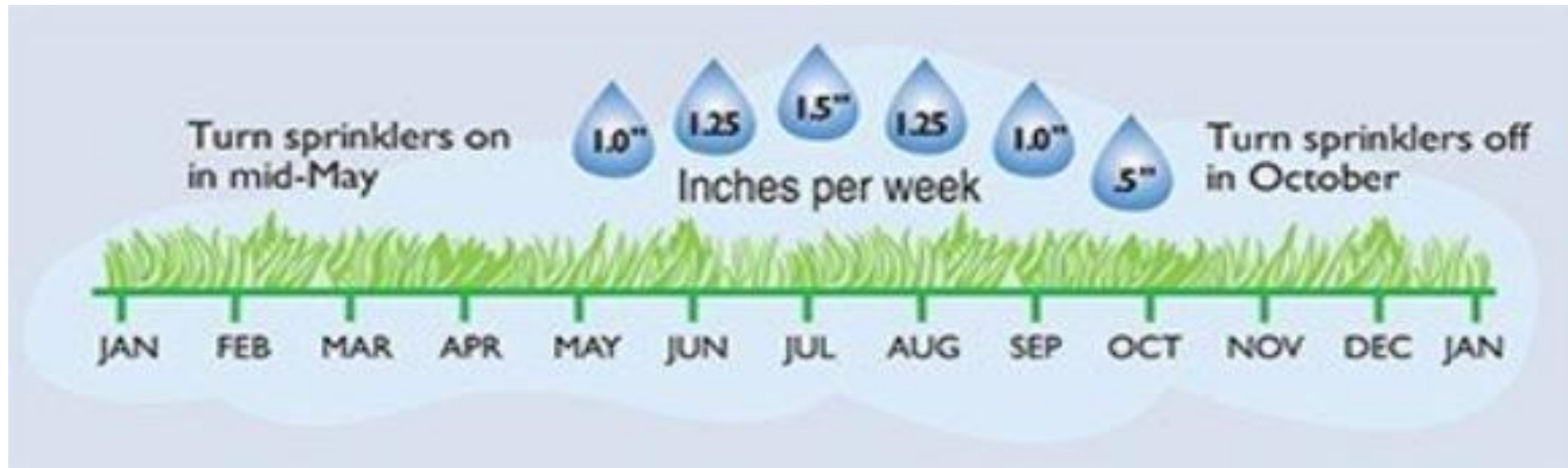


Fig. 4. Root hair development of Kentucky-31 under well-watered conditions (A), after 14 d of dry down (B), and after 28 d of dry down (C) and (D). Arrows indicate root hairs. The horizontal bar in D represents 100 μm .

Signs Of Drought Stress



Average Weekly Water Loss



Precision Irrigation

- Smart controllers
- Soil moisture sensors
- Auditing



Controller Adjustments

- Watering on a “schedule” is a poor management practice
- Don’t set it & forget it!
- Take note of upcoming and previous weather events
- Water just before sunrise

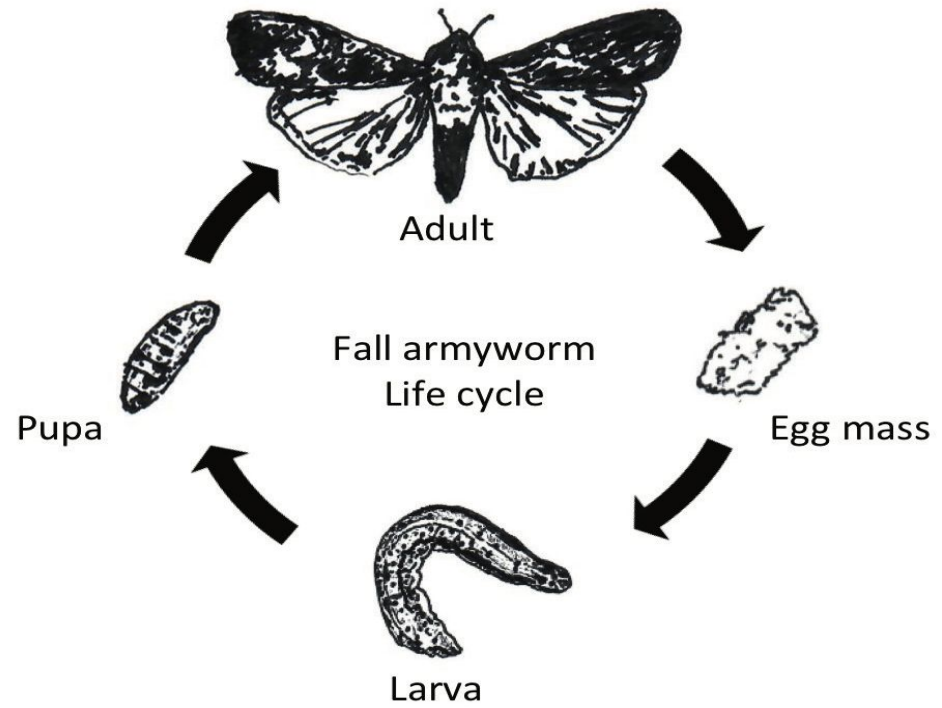


Fall Army Worm

- Loss of acres of turf over the region
- Populations moved with “un-normal” weather patterns
- Do not over winter here
- Multiple generations possible
- Females can lay 1000+ eggs
- 100% tall fescue stands hit the hardest



Life Cycle



FAW IPM

- Scout for egg masses and caterpillars
- Soapy water test
- Threshold of 2-3/sqft
- Pyrethroids provide excellent knock down control, but must act quickly!!
- Preventative insecticides work best, but this doesn't mean we need to spray the world to prevent a pest that is once in a generation!!!!



Take Home Message FAW

- Multi-species turf stands faired much better-TF monocultures faired poorly
- Bluegrasses were mostly left alone
- Some bermudagrass damage
- Unsure of zoysia damage

