AGRICULTURAL BEST MANAGEMENT PRACTICES ASSESSMENT TOOL (BMPAT)

DEL BOTTCHER

SOIL AND WATER ENGINEERING TECHNOLOGY INC.

GAINESVILLE, FL



OBJECTIVES

- Provide FDACS staff and farmers with a tool that estimates the quantitative water quality and quantity benefits of selected BMPs
- Generate implementation/O&M costs for BMPs so Cost-Effectiveness estimates can also be provided
- Use in concert with FDACS BMP Manuals for better optimization of farm BMPs
- Work with growers to make the BMPAT as User Friendly as possible.

LONG TERM OBJECTIVE

- Include all agricultural commodities in BMPAT
- Cow/Calf and Sod Production Completed
- Citrus Production to be completed 2022.
- The following commodities to be scheduled:
 - Vegetable and Agronomic Crops
 - Equine
 - Nurseries
 - Poultry
 - Specialty Fruit and Nut Crops



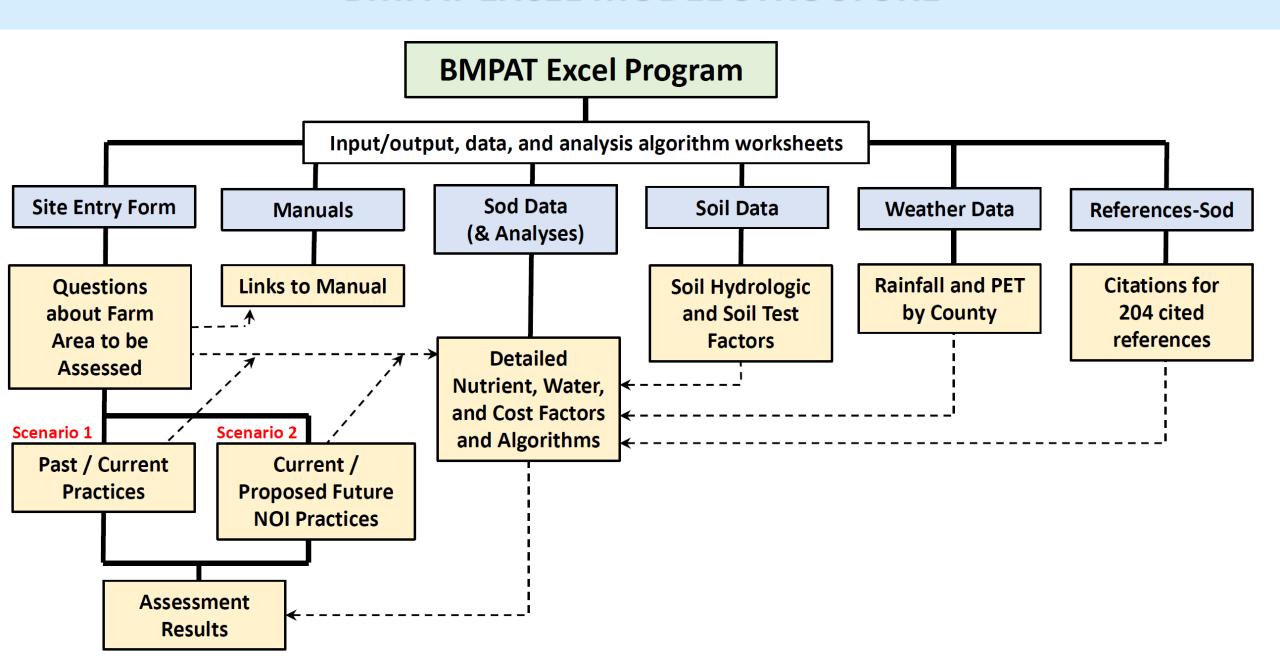
SCOPE OF WORK

- Form a grower based advisory group to assist in development and review.
- Complete a literature review.
- Develop BMPAT Structural Design Report.
- Develop BMPAT Parameterization Report
- Develop BMPAT User Guide
- Provide training sections.





BMPAT EXCEL MODEL STRUCTURE





Best Management Practice Assessment Tool

BMPAT

Developed by

Soil and Water Engineering Technology, Inc.

For

Florida Department of Agriculture and Consumer Services

Version 1.8

View Brief Introductory Text: Click Here

Area Being Assessed

25

Acres

SCOEL

Enter Name of Area/Field:

SOD FARM SOUTH - Bermuda Field A

Select Applicable FDACS BMP Manual:

Select the County the Farm is Located In:

Select the Dominant Soil Type:

Recharge Potential:

Low

Open Link to NRCS Soils Map

Name of Area Being Assessed

Complete separate BMPAT assessments for significantly different conditions on the farm, such as different crops, animal densities, or soils, e.g., semi-improved and improved pastures or well drained vs poorly drained soils should be evaluated separately.

Myakka

Optional User Information:

User Name:

Date: 6/7/2020

Legend

Pull-Down Menus

User Input

Results

SCROLL DOWN TO CONTINUE

Enter Farming Practices for Sod Operation					Note: Diff.				
Scenario 1 - P	revious or Curr	ent Practices			Scenario 2 - Current	or Proposed	BMP (NOI) Practi	ices	Flag*
Sod Grass	s and General Man	agement		Grass and Pasture Grazing Management			₩		
Type of Sod Grass being Grown?	Berm	udagrass		T	ype of Sod Grass being Grown?	Berm	udagrass		
Weed Management:	All of t	he Above			Weed Management:	All of	the Above		
The 4 R's of Nutrient Management:	RIGHT (Source, Ra	te, Time, and Equipm	ent/Handling)	1	The 4 R's of Nutrient Manageme	ent: (Source, Rate	, Time, and Equipmen	t/Handling)	
RIGHT SOURCE Type of Fertilizer Being Used?	Commercial Co	ontrolled Release		RIGHT SOURC	EType of Fertilizer Being Used?	Commercial C	Controlled Release		
		No Entry>					No Entry>		
		No Entry>					No Entry>		
		No Entry>					No Entry>		
RIGHT RATE Fertilizer Rate Method?	Personal Judgr	ment-Enter Rates		RIGHT RATE	Fertilizer Rate Method?	Personal Judg	ment-Enter Rates		
Enter Actual N Rate:	400	lbs-N/acre/year			Enter Actual N Rate:	400	lbs-N/acre/year		
Enter Actual P Rate:	100	lbs-P2O5/acre/year			Enter Actual P Rate:	100	lbs-P2O5/acre/year		
RIGHT TIME Split Applications?	Yes	Number/Year =	4	RIGHT TIME	Split Applications?	Yes	Number/Year =	4	
Application Rates Adjusted by Growth	Stage and Season?	Yes		Applicati	on Rates Adjusted by Growth St	tage and Season?	Yes		
RIGHT APPLICATION EQUIPMENT AND HA	NDLING		_	RIGHT APPLICATION EQUIPMENT AND HANDLING					
Does Fertilizer spreader avo	oid furrow ditches?	No			Does Fertilizer spreader avoid	d furrow ditches?	No		
Percent of Fertilizer Appli	ed via Fertigation?	50%			Percent of Fertilizer Applie	d via Fertigation?	50%		
Is Banding of Fertilizer on Strips Used?	Yes	Note: Banding C	an Limit Runners Growth	Is Band	ling of Ferilizer on Strips Used?	Yes	Note: Banding Ca	n Limit Runners Growth	
Comments>	Selected Grass is 1	Гуріcally Not Strip Ha	rvested??		Comments>	Selected Grass is	Typically Not Strip Ha	rvested??	
How Often is Fertilizer Equi	pment Calibrated?	Every Day			How Often is Fertilizer Equip	ment Calibrated?	Every Day		
Proper Fertilizer Storage/Handling Faci	lities and Training	Procedures in Place?	Yes	Proper F	ertilizer Storage/Handling Facili	ities and Training	Procedures in Place?	Yes	
Phosphorus Soil Test Results				Phosphorus Soil Test Results					
Latest P Soil Test:	Enter S	Soil P Data			Latest P Soil Test:	Enter S	Soil P Data		
	200	mg/kg = ~	400 lbs-P/ac			200	mg/kg = ~	400 lbs-P/ac	

Irrig	ation Managemer	nt:		Irrigation Management:				
Irrigation Method?	N	one		Irrigation Method?		None		
No Data Entry =>				No Data Entry =>				
	No Data Entry=>	try=>			No Data Entry=>	·		
	No Data Entry=>				No Data Entry=>	>		
Tailwater Recovery for Irrigation Reuse?	No			Tailwater Recovery for Irrigation Reuse?	No			
No Data Entry =>				No Data Entry =>				
Dra	inage Managemer	it:		Dra	ainage Managem	ent:		
No Data Entry =>			<not for="" soil="" td="" type<="" your=""><td>No Data Entry =></td><td></td><td></td><td><not for="" soil="" td="" type<="" your=""><td></td></not></td></not>	No Data Entry =>			<not for="" soil="" td="" type<="" your=""><td></td></not>	
Select Drainage Practice	In-Field Fu	rrow Ditches		Select Drainage Practice	In-Field F	urrow Ditches		
Field Laser Leveled?	١	'es		Field Laser Leveled?		Yes		
Are Harvesting Strips Directly Down Slope?	\	'es		Are Harvesting Strips Directly Down Slope?		Yes		
Furrow Ditches Allowed to Grass Over?	١	'es		Furrow Ditches Allowed to Grass Over?		Yes		
Farm Ditches Condition?	Bar	e Soil		Farm Ditches Condition?	Bare Soil			
Plar	nting and Harvesti	ng		Planting and Harvesting				
How Often is Field Tilled and Replanted?	10	Years		How Often is Field Tilled and Replanted?	10	Years		
Time Between Harvests?	12	Months		Time Between Harvests?	12	Months		
Percent of Grass Harvested?	100%			Percent of Grass Harvested?	100%			
Depth of Soil Harvested with Sod?		Inches		Depth of Soil Harvested with Sod?		Inches		
Stream/Sl	ough/Sinkhole Pro	otection:		Stream/Slough/Sinkhole Protection:				
Streams/Sloughs/Sinkholes within Field?	Yes	1000	<enter (ft)<="" length="" td=""><td>Streams/Sloughs/Sinkholes within Field?</td><td>Yes</td><td>1000</td><td><enter (ft)<="" length="" td=""><td></td></enter></td></enter>	Streams/Sloughs/Sinkholes within Field?	Yes	1000	<enter (ft)<="" length="" td=""><td></td></enter>	
Practices Being Used?	Grassed '	Waterways		Practices Being Used?	Grassed	d Waterways		
Wetlands	and Stormwater			Wetlands and Stormwater Storage:				
Wetlands Present?	Yes	50%	percent of Field Area?	Wetlands Present?	Yes	50%	percent of Field Area?	
Select Condition?		Water Storage		Select Condition?		or Water Storage		
F	ercent Restored?	50%		Percent Restored? 50%				
Edge	of Ranch Treatme	ent:		Edg	e of Ranch Treati	ment:		
Retention, not part of Tailwater Recovery ?	No	No Entry>		Retention, not part of Tailwater Recovery ?	No	No Entry>		
No Entry>				No Entry>				
Groundwater Nitrate Mitigation System?	No		,	Groundwater Nitrate Mitigation System?				
No Entry>				No Entry>				

	Scenario 1 - P	revious or Current Practices	
	Sod Grass	and General Management	
Ту	pe of Sod Grass being Grown?	Bermudagrass	•
	Weed Management:	Bahiagrass	
2746 - 12	weed Management.	Bermudagrass	
The 4	R's of Nutrient Management	Centipedegrass	t/H
IGHT SOURCE	Type of Fertilizer Being Used?	Zoysiagrass	0
		Perennial Peanut Paspalum	
		Enter Percent of applied as Granular?	
IGHT RATE	Fertilizer Rate Method?	On-Farm Experience-Enter Rates	

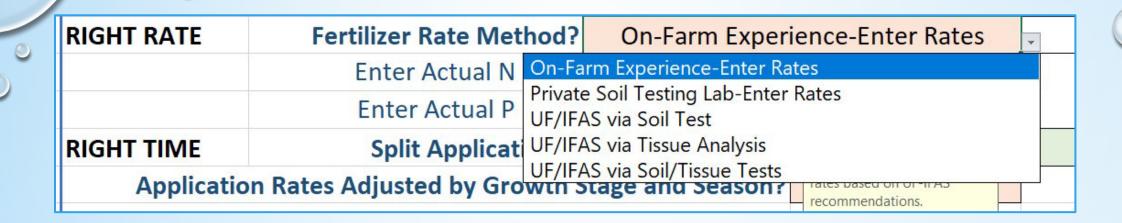
	Scenario 1	- Pr	evious or Current Practices		
	Sod (Grass	and General Management		
Ту	pe of Sod Grass being Gro	wn?	Bermudagrass		
	Weed Management:		All of the Above	-	
The 4	The 4 R's of Nutrient Managen Herbicide Control of Weeds			nt/Han	
RIGHT SOURCE	Type of Fertilizer Being				
		All of	the Above		

FERTILIZER MANAGEMENT

The 4	The 4 R's of Nutrient Management: RIGHT (Source, Rate, Time, and Equipment/Handling)				
RIGHT SOURCE	Type of Fertilizer Being Used	Commercial Non-controlled Release	*		
	Comm Bio-Sc				
RIGHT RATE	Fertilizer Rate Method?	ontrolled + Controlled Release ontrolled Release + Biosolids On-Farm Experie organics	100%		

The 4	The 4 R's of Nutrient Management: RIGHT (Source, Rate, Time, and Equipment/Handling)						
RIGHT SOURCE	Type of Fertilizer Being Used	Commercial Non-controlled Release					
			No Entry>				
			No Entry>				
	Enter Percent of applied as Granular?						

The 4 R's of Nutrient Management: RIGHT (Source, Rate, Time, and Equipment/Handling)					
RIGHT SOURCE	Type of Fertilizer Being Used	Non-controlled + Controlled Release			
E	20%				
E	Enter Percent of Annual P Applied as Controlled Release or Boisolids?				
		Enter Percent of applied as Granular?	100%		



RIGHT RATE	Fertilizer Rate Method?	On-Farm Experience-Enter Rates	
	Enter Actual N Rate:	320	lbs-N/acre/year
	Enter Actual P Rate:	80	lbs-P2O5/acre/year

RIGHT TIME	Split Applications?	Yes	Number/Year =	4
Application F	Rates Adjusted by Growth S	tage and Season?	Yes	

FERTILIZER MANAGEMENT CONT'

Is Banding of Fertilizer on Strips Used?	Y	es	ote: Banding Can Lin	nit Runners Growth
How Often is Fertilizer Equip	ment Cal	Fertilize	r Banding on Strips	
Fertilizer Handling/Storage Training Pro	cedures i		es" if banding fertilizer	
Approved Fertilizer Storage/Ha	andling Fa		e grass strips left after	
Phosphorus Soil Test Results			resting is done. NOTE:	
Latest P Soil Test:			fertilizer on grass strips	
	2(pically recommended s potential to reduce	lbs-P/ac
Irrig	gation Ma	runners		
Irrigation Method?	Se			

How Often is Fertilizer Equip	ment Calibrated?	Every Day	
Proper Fertilizer Storage/Handling Facilit	ties and Trail Every	Day	
Phosphorus Soil Test Results	Week Rarely	,	

FERTILIZER MANAGEMENT - SOIL TESTING

Phosphorus S	oil Test Results			
	Latest P Soil	Test:	Enter Soil P Data	
		No Soil Tests Low Medium		
	Irrigation Met	High		
	No Data Ent	Very High Enter Soil P Da	nta	

Phosphorus Soil Test Results			
Latest P Soil Test:	Enter 9	Soil P Data	
	200	mg/kg = ~	400 lbs-P/ac

Irrig	gation Management:
Irrigation Method?	Seepage - Furrow Ditches
Scheduling Met None Overh	ead
Seepa	ge - Furrow Ditches
Seepa	ge - Subsurface Drain Lines

	Irrig	gation Management:	N#	
Irrigation Met	hod?	Seepage - Furrow Ditches		
Scheduling Met	Scheduling Method?		+	
Targette Tailwater Recovery for Irrigation Re	Weath Moist	ner Station w/ App ure Sensors	iches	
No Data Ent Irrigation Pass-thru Detection				

Tailwater Recovery for Irrigation Reuse?	Yes	
Enter Volume of Stormwater =	2	Inches of Collected Stormwater

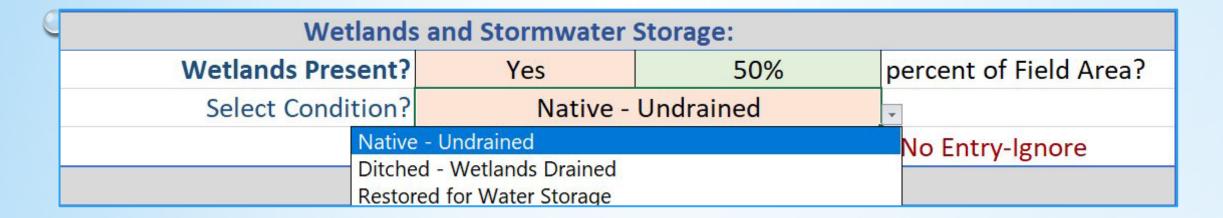
Dra	ainage Management:	
Select Drainage Practice	No Ditching	v
No Data Ent No D	No Data Ent No Ditching	
No Data Ent Non Vege	Vegetated Ditches tatived/Grassed Waterways	Not For Your Soil Type
No Data Entry =>	also have surface runoff causing	<not for="" soil="" th="" type<="" your=""></not>
No Data Entry =>	erosion issues.	<not for="" soil="" th="" type<="" your=""></not>
No Data Entry =>	>	<not for="" soil="" th="" type<="" your=""></not>

	Dra	inage Management:	
	No Data Entry =>		<not for="" soil="" th="" type<="" your=""></not>
	Select Drainage Practice	Subsurface Drain Lines	v
	Field Laser Lev In-Fiel		
Λ	Subsul	rface Drain Lines	

	Drainage Management:		
	No Data Entry =>		<not for="" soil="" th="" type<="" your=""></not>
	Select Drainage Practice	Subsurface Drain Lines	
	Field Laser Leveled?	Yes	
Are Harvesti	ng Strips Directly Down Slope?	Yes	
Furrow [Ditches Allowed to Grass Over?	Yes	

Pla	Planting and Harvesting			
How Often is Field Tilled and Replanted?	10	Years		
Time Between Harvests?	12	Months		
Percent of Grass Harvested?	100%			
Depth of Soil Harvested with Sod?	0.2	Inches		

Strea	Stream/Slough/Sinkhole Protection:				
Streams/Sloughs/Sinkholes within Fi	eld?	Yes	1000	<e< td=""><td>inter Length (ft)</td></e<>	inter Length (ft)
Practices Being U	Jsed?	Field	Borders	-	
Wet	Wet None				
Wetlands Pres	Riprarian Buffers -Fenced Field Borders		cent of Field Area?		
Select Condi	i Filter Strips				
	Grassed Waterways				



Wetlands and Stormwater Storage:				
Wetlands Present?	Yes	50%	percent of Field Area?	
Select Condition?	Restored for Water Storage			
Percent Restored?		50%		



Edge of Ranch Treatment:				
Retention, not part of Tailwater Recovery?	Yes	Volume (Inches) =	2	
Any Additional Stormwater Treatment?	Chemical	Treatment	٧	
Groundwater Nitrate Mitigation Sys No E No E No E No, just retention Artificial Wetlands Chemical Treatment			de	

Groundwater Nitrate Mitigation System?	Yes
Type of GW Treatment Being Used?	Both Interceptor Wells & Bioreactor
	on Interceptor Wells ification Bioreactor
Both I	nterceptor Wells & Bioreactor

Enter Farming Practices for Sod Operation									
Scenario 1 - Previous or Current Practices					Scenario 2 - Current or Proposed BMP (NOI) Practices				
Sod Grass and General Management				Grass and Pasture Grazing Management					₩
Type of Sod Grass being Grown?	Bermudagrass			Type of Sod Grass being Grown?		Bermudagrass			
Weed Management:	All of the Above			Weed Management: All of the Above					
The 4 R's of Nutrient Management: RIGHT (Source, Rate, Time, and Equipment/Handling)				The 4 R's of Nutrient Management: (Source, Rate, Time, and Equipment/Handling)					
RIGHT SOURCE Type of Fertilizer Being Used?	Commercial Non-controlled Release			RIGHT SOURCEType of Fertilizer Being Used?		Commercial Non-controlled Release			
		No Entry>					No Entry>		
		No Entry>					No Entry>		
_		pplied as Granular?	100%				applied as Granular?	100%	
RIGHT RATE Fertilizer Rate Method?	On-Farm Experie			RIGHT RATE	Fertilizer Rate Method?		rience-Enter Rates		
Enter Actual N Rate:		bs-N/acre/year			Enter Actual N Rate:	320	lbs-N/acre/year		
Enter Actual P Rate:		bs-P2O5/acre/year			Enter Actual P Rate:	80	lbs-P2O5/acre/year		.
RIGHT TIME Split Applications?	Yes	Number/Year =	4	RIGHT TIME	Split Applications?		Number/Year =	4	
Application Rates Adjusted by Growth S		Yes			on Rates Adjusted by Growth S	_	Yes		
					CATION EQUIPMENT AND H. Does Fertilizer spreader avoi		Yes	1	
Percent of Fertilizer Applie	_	No 50%			Percent of Fertilizer Applie		50%		
			un Linnik Deumanna Guareth	la Dand] on Lineit Demonder Cucarath	
	Anding of Fertilizer on Strips Used? Yes Note: Banding Can Limit Runners Growth Comments > Selected Grass Typically Does Not Have Strips after Harvest!			is band	ing of Ferilizer on Strips Used?		Typically Not Strip H	an Limit Runners Growth	
		-	s strips after narvest:					arvesteurr]	
How Often is Fertilizer Equip		Every Day	Voc	Proper E	How Often is Fertilizer Equip			Yes	
Proper Fertilizer Storage/Handling Facilities and Training Procedures in Place? Yes				1 '					
Phosphorus Soil Test Results Latest P Soil Test: Enter Soil P Data			Phosphorus Soil Test Results Latest P Soil Test: Enter Soil P Data						
Latest P 3011 Test.			400 lbs-P/ac		Latest P 3011 Test.	200	mg/kg = ~	J 400 lbs-P/ac	
Irrig	Irrigation Management:			Irrigation Management:					
Irrigation Method?	Seepage - Fu				Irrigation Method?		Furrow Ditches		
Scheduling Method?	Irrigation Pass-				Scheduling Method?		ss-thru Detection	-	
Scheduling Wethou.	No Data Entry=>	tina Detection			Solicaum Weemoa.	No Data Entry=>			
Irrigation Pass-thru Flov	, _	Dacc-thru Irriga	ation Flow Allowed		Irrigation Pass-thru Flov	,		tion Flow Minimized	1
Tailwater Recovery for Irrigation Reuse?		r ass-till a liftige	ation How Allowed	Tailwater	Recovery for Irrigation Reuse?		r ass-till a liftiga	tion riow willimized	
No Data Entry =>	NO			Tallwater	No Data Entry =>				
,	inage Management				<u>, </u>	ainage Managem	ont:		
No Data Entry =>	illage ivialiagellielli		<not for="" soil="" td="" type<="" your=""><td></td><td></td><td></td><td>ent.</td><td><not for="" soil="" td="" type<="" your=""><td></td></not></td></not>				ent.	<not for="" soil="" td="" type<="" your=""><td></td></not>	
· •	In-Field Furi		Not for Your Soil Type		No Data Entry =>		urrow Ditches	Not for four soil Type	
Select Drainage Practice Field Laser Leveled?					Select Drainage Practice Field Laser Leveled?			-	
Are Harvesting Strips Directly Down Slope?		es es		Ano Hames - +1	Field Laser Leveled? ing Strips Directly Down Slope?		Yes Yes	-	



BMPAT RESULTS



For

' SOD FARM SOUTH - Bermuda Field A' 6/7/2020

Item	Units	Scenario 1	Scenario 2	Change	
		Practices	Practices	Value	Percent
Runoff	in/yr in/yr	15.64	14.34	-1.30	-8% -8%
Recharge		0.48	0.44	-0.04	
N Concentration in Runoff	mg/l	4.45	4.14	-0.31	-7%
N Concentration in Recharge	mg/l	13.61	12.95	-0.66	-5%
N Load in Runoff	lbs/ac/yr	15.76	13.46	-2.30	-15%
N Load in Recharge	lbs/ac/yr	1.49	1.30	-0.19	-13%
Total N Load from Field	lbs/ac/yr	17.25	14.76	-2.49	-14%
P Concentration in Runoff	mg/l	0.86	0.85	-0.01	-1%
P Concentration in Recharge	mg/l	0.02	0.02	0.00	0%
P Load in Runoff	lbs/ac/yr	3.03	2.75	-0.28	-9%
P Load in Recharge	lbs/ac/yr	0.00	0.00	0.00	-8%
Total P Load from Field	lbs/ac/yr	3.04	2.75	-0.28	-9%
Impact on	Cost Eff	ectiveness			
Annual Farm Income	(\$/Ib R	temoved)			
(\$/ac/yr)	N	Р		10	
-\$2	\$1	\$7			



QUESTIONS

DBOTTCHER@SWET.COM