AGRICULTURAL BEST MANAGEMENT PRACTICES ASSESSMENT TOOL (BMPAT)

DEL BOTTCHER

SOIL AND WATER ENGINEERING TECHNOLOGY INC.
GAINESVILLE, FL

OBJECTIVES

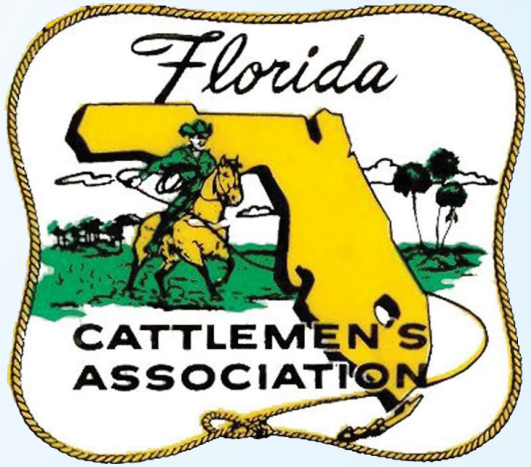
- Provide FDACS staff and farmers with a tool that estimates the quantitative water quality and quantity benefits of selected BMPs
- Generate implementation/O&M costs for BMPs so Cost-Effectiveness estimates can also be provided
- Use in concert with FDACS BMP Manuals for better optimization of farm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

LONG TERM OBJECTIVE

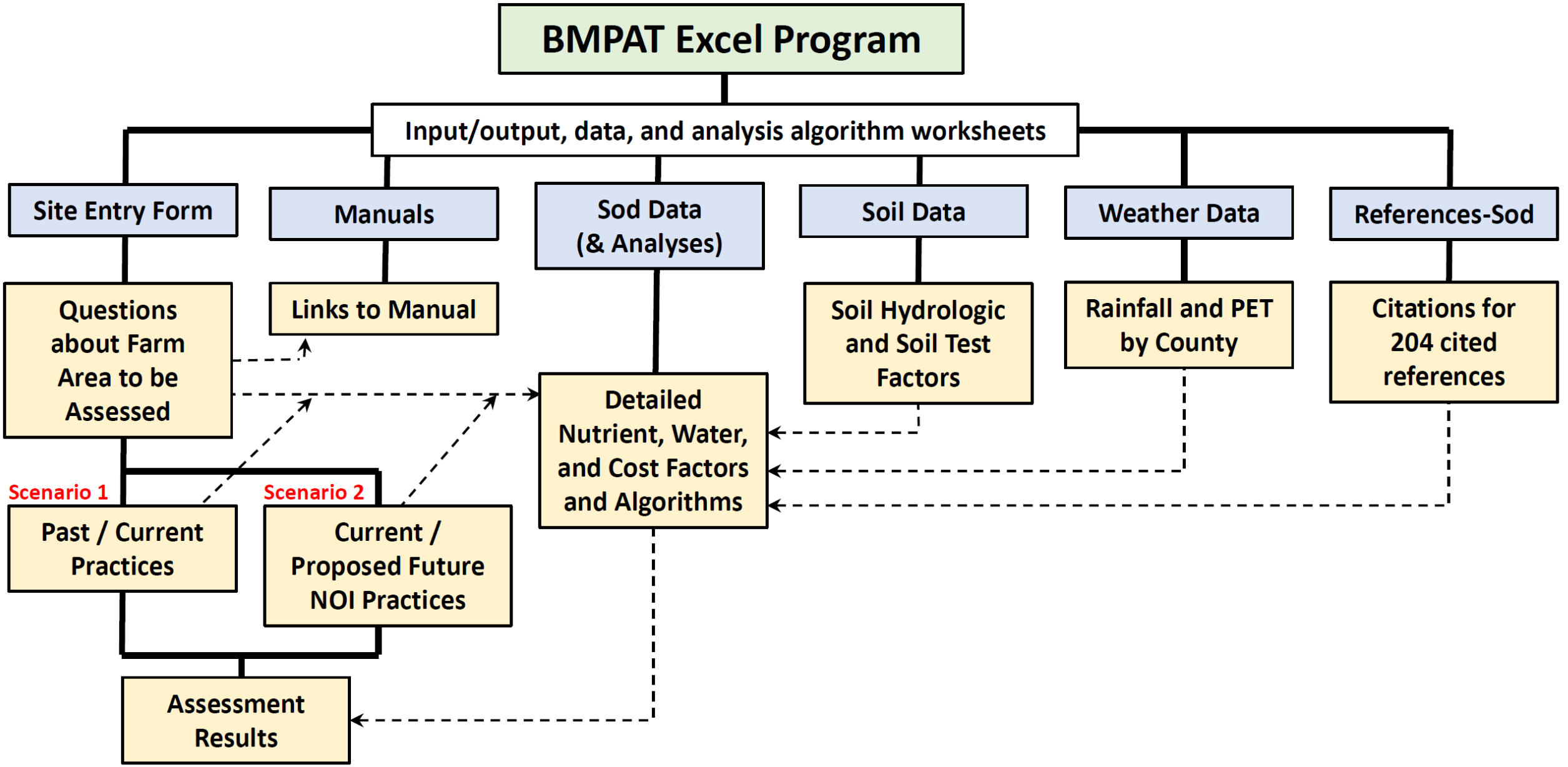
- Include all agricultural commodities in BMPAT
- Cow/Calf and Sod Production Completed
- Citrus Production to be completed 2022.
- The following commodities to be scheduled:
  - Vegetable and Agronomic Crops
  - Equine
  - Nurseries
  - Poultry
  - Specialty Fruit and Nut Crops

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



6/16/2021

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

Legend	
Pull-Down Menus	
User Input	
Results	

View Brief Introductory Text: *Click Here*

Enter Name of Area/Field: SOD FARM SOUTH - Bermuda Field A

Area Being Assessed: 25 Acres

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.

Select Applicable FDACS BMP Manual:

Select the County the Farm is Located In:

Select the Dominant Soil Type: Myakka

Recharge Potential: *Low*

☐ Open Link to NRCS Soils Map

Optional User Information:

User Name:

Date: 6/7/2020

SCROLL DOWN TO CONTINUE

Enter Farming Practices for Sod Operation

Note: Diff. Flag* ↓

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 Controlled Release			RIGHT SOURCE Type of Fertilizer Being Used?	Commercial Controlled Release		
	No Entry>				No Entry>		
	No Entry>				No Entry>		
	No Entry>				No Entry>		
RIGHT RATE Fertilizer Rate Method?	Personal Judgment-Enter Rates			RIGHT RATE Fertilizer Rate Method?	Personal Judgment-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			Application Rates Adjusted by Growth Stage and Season?	Yes		
RIGHT APPLICATION EQUIPMENT AND HANDLING				**RIGHT APPLICATION EQUIPMENT AND HANDLING**			
Does Fertilizer spreader avoid furrow ditches?	No			Does Fertilizer spreader avoid furrow ditches?	No		
Percent of Fertilizer Applied via Fertigation?	50%			Percent of Fertilizer Applied via Fertigation?	50%		
Is Banding of Fertilizer on Strips Used?	Yes	Note: Banding Can Limit Runners Growth		Is Banding of Ferilizer on Strips Used?	Yes	Note: Banding Can Limit Runners Growth	
Comments>	Selected Grass is Typically Not Strip Harvested??			Comments>	Selected Grass is Typically Not Strip Harvested??		
How Often is Fertilizer Equipment Calibrated?	Every Day			How Often is Fertilizer Equipment Calibrated?	Every Day		
Proper Fertilizer Storage/Handling Facilities and Training Procedures in Place?	Yes			Proper Fertilizer Storage/Handling Facilities and Training Procedures in Place?	Yes		
Phosphorus Soil Test Results				**Phosphorus Soil Test Results**			
Latest P Soil Test:	Enter Soil P Data			Latest P Soil Test:	Enter Soil P Data		
	200	mg/kg = ~	400 lbs-P/ac		200	mg/kg = ~	400 lbs-P/ac

Irrigation Management:			
Irrigation Method?	None		
No Data Entry =>			
	No Data Entry=>		
	No Data Entry=>		
Tailwater Recovery for Irrigation Reuse?	No		
No Data Entry =>			

Drainage Management:		
No Data Entry =>		<Not for Your Soil Type
Select Drainage Practice	In-Field Furrow Ditches	
Field Laser Leveled?	Yes	
Are Harvesting Strips Directly Down Slope?	Yes	
Furrow Ditches Allowed to Grass Over?	Yes	
Farm Ditches Condition?	Bare Soil	

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

Stream/Slough/Sinkhole Protection:			
Streams/Sloughs/Sinkholes within Field?	Yes	1000	<Enter Length (ft)
Practices Being Used?	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 ?	No	No Entry>
No Entry>		
Groundwater Nitrate Mitigation System?	No	
No Entry>		

Irrigation Management:			
Irrigation Method?	None		
No Data Entry =>			
	No Data Entry=>		
	No Data Entry=>		
Tailwater Recovery for Irrigation Reuse?	No		
No Data Entry =>			

Drainage Management:		
No Data Entry =>		<Not for Your Soil Type
Select Drainage Practice	In-Field Furrow Ditches	
Field Laser Leveled?	Yes	
Are Harvesting Strips Directly Down Slope?	Yes	
Furrow Ditches Allowed to Grass Over?	Yes	
Farm Ditches Condition?	Bare Soil	

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

Stream/Slough/Sinkhole Protection:			
Streams/Sloughs/Sinkholes within Field?	Yes	1000	<Enter Length (ft)
Practices Being Used?	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 ?	No	No Entry>
No Entry>		
Groundwater Nitrate Mitigation System?	No	
No Entry>		

Scenario 1 - Previous or Current Practices

Sod Grass and General Management

Type of Sod Grass being Grown?	Bermudagrass
Weed Management:	

- Bahiagrass
- Bermudagrass
- Centipedegrass
- St. Augustinegrass
- Zoysiagrass
- Perennial Peanut
- Paspalum

The 4 R's of Nutrient Management

IGHT SOURCE	Type of Fertilizer Being Used?	
		Enter Percent of applied as Granular?
IGHT RATE	Fertilizer Rate Method?	On-Farm Experience-Enter Rates

Scenario 1 - Previous or Current Practices

Sod Grass and General Management

Type of Sod Grass being Grown?	Bermudagrass
Weed Management:	All of the Above

The 4 R's of Nutrient Manage

- Herbicide Control of Weeds
- Routine Mowing
- Ditch/fallow Weed Control
- All of the Above

RIGHT SOURCE	Type of Fertilizer Being

FERTILIZER MANAGEMENT

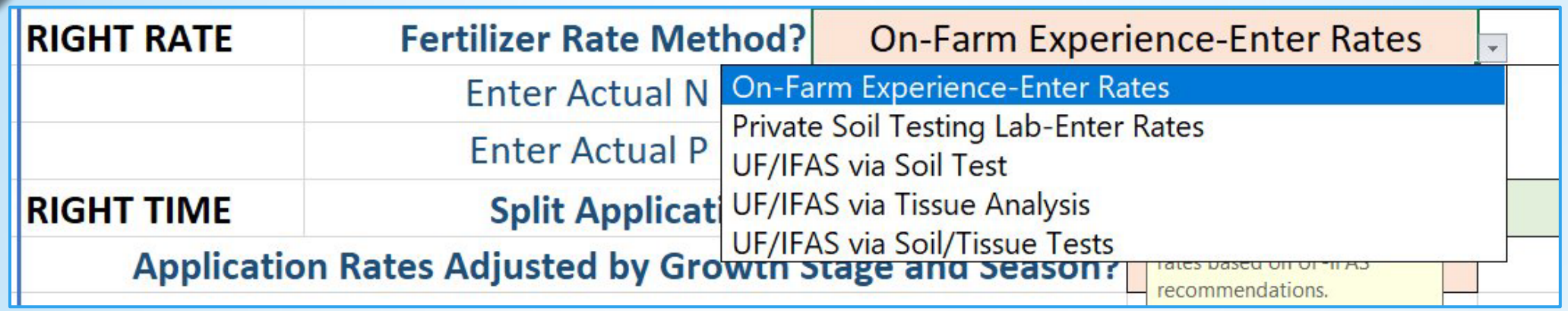
The 4 R's of Nutrient Management: **RIGHT** (Source, Rate, Time, and Equipment/Handling)			
RIGHT SOURCE	**Type of Fertilizer Being Used?**	Commercial Non-controlled Release	
			100%
RIGHT RATE	**Fertilizer Rate Method?**	On-Farm Experie	

Commercial Non-controlled Release
Commercial Controlled Release
Bio-Solids
Non-controlled + Controlled Release
Non-controlled Release + Biosolids

organics

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?	100%

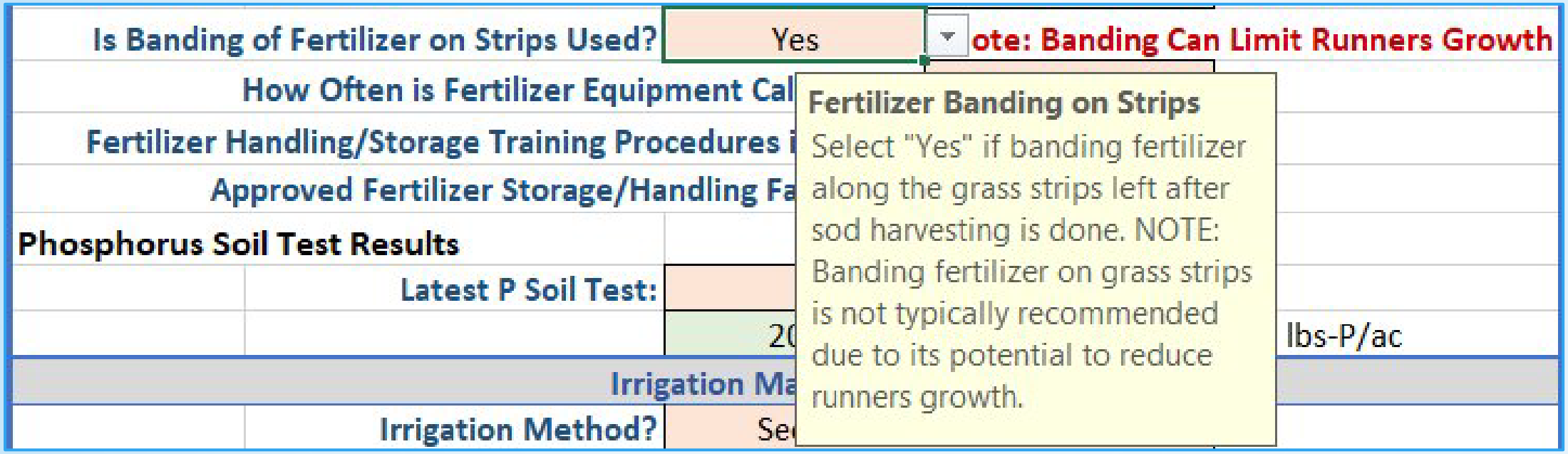
The 4 R's of Nutrient Management: **RIGHT** (Source, Rate, Time, and Equipment/Handling)			
RIGHT SOURCE	**Type of Fertilizer Being Used?**	Non-controlled + Controlled Release	
		Enter Percent of Annual N Applied as Controlled Release or Biosolids?	20%
		Enter Percent of Annual P Applied as Controlled Release or Boisolids?	0%
		Enter Percent of applied as Granular?	100%



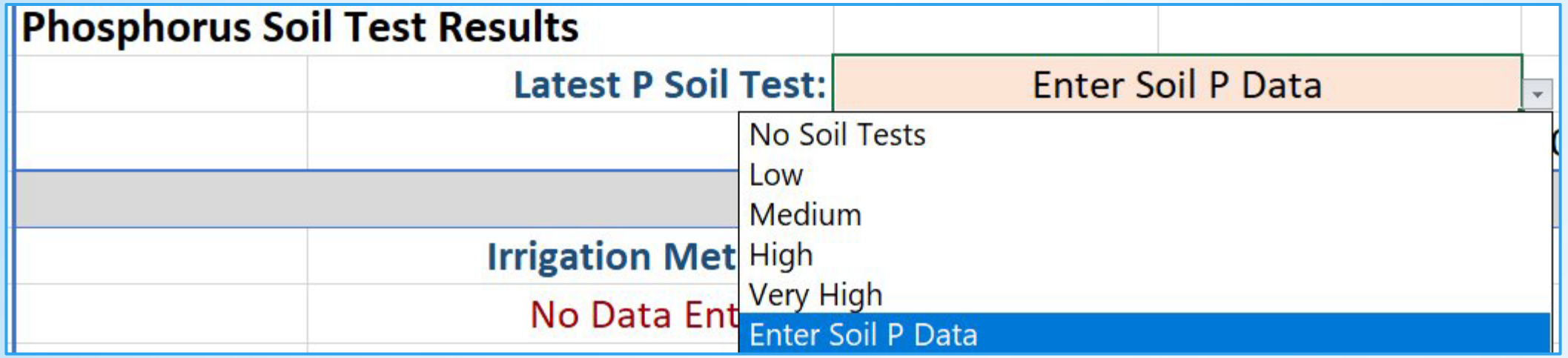
RIGHT RATE	Fertilizer Rate Method?	On-Farm Experience-Enter Rates	
	Enter Actual N Rate:	320	lbs-N/acre/year
	Enter Actual P Rate:	80	lbs-P2O5/acre/year

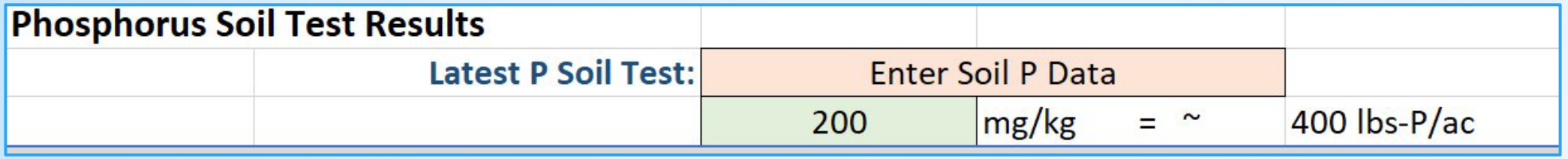
RIGHT TIME	Split Applications?	Yes	Number/Year =	4
	Application Rates Adjusted by Growth Stage and Season?		Yes	

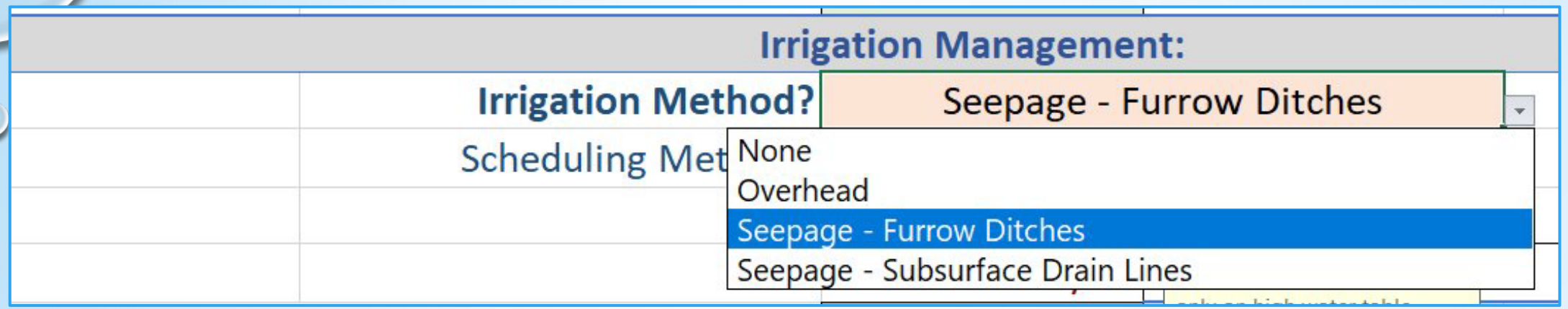
FERTILIZER MANAGEMENT CONT'

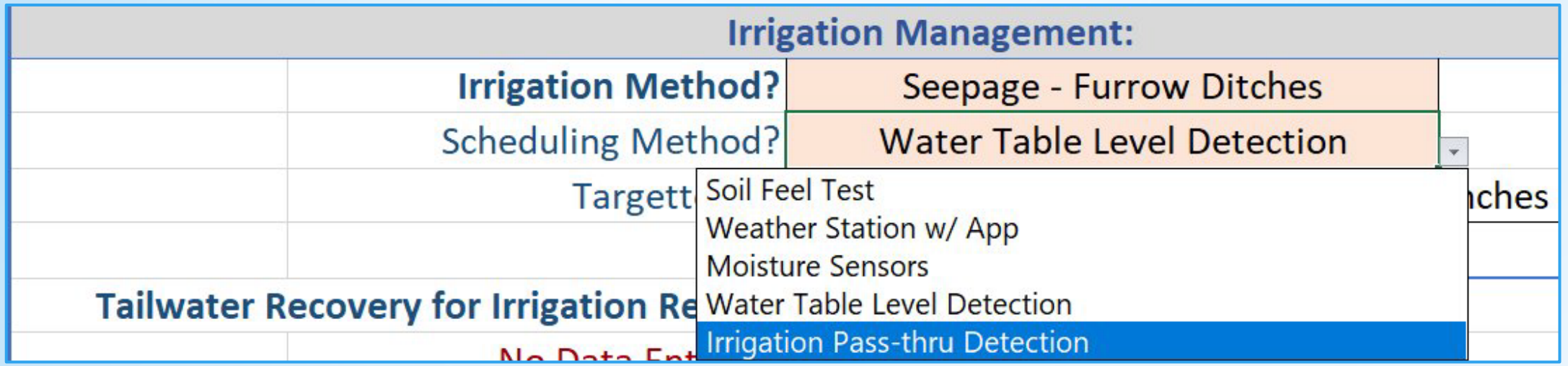


FERTILIZER MANAGEMENT – SOIL TESTING









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

Drainage Management:			
	Select Drainage Practice	No Ditching	
	No Data Ent	No Ditching	Not For Your Soil Type
	No Data Ent	Non Vegetated Ditches	Not For Your Soil Type
	No Data Entry =>	Vegetatived/Grassed Waterways	<Not For Your Soil Type
	No Data Entry =>		<Not For Your Soil Type
	No Data Entry =>		<Not For Your Soil Type

groundwater is a concern, but can also have surface runoff causing erosion issues.

Drainage Management:			
	No Data Entry =>		<Not for Your Soil Type
	Select Drainage Practice	Subsurface Drain Lines	
	Field Laser Lev	In-Field Furrow Ditches	
	Are Harvesting Strips Directly Down S	Subsurface Drain Lines	

Drainage Management:			
	No Data Entry =>		<Not for Your Soil Type
	Select Drainage Practice	Subsurface Drain Lines	
	Field Laser Leveled?	Yes	
	Are Harvesting Strips Directly Down Slope?	Yes	
	Furrow Ditches Allowed to Grass Over?	Yes	

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	

Stream/Slough/Sinkhole Protection:			
Streams/Sloughs/Sinkholes within Field?	Yes	1000	<Enter Length (ft)
Practices Being Used?	Field Borders		
Wet			
Wetlands Pres			rcent of Field Area?
Select Condi			

- None
- Riprarian Buffers -Fenced
- Field Borders
- Filter Strips
- Grassed Waterways

Wetlands and Stormwater Storage:			
Wetlands Present?	Yes	50%	percent of Field Area?
Select Condition?	Native - Undrained		
			No Entry-Ignore

- Native - Undrained
- Ditched - Wetlands Drained
- Restored for Water Storage

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		
Groundwater Nitrate Mitigation Sys			
No E			

- No, just retention
- Artificial Wetlands
- Chemical Treatment

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

- Irrigation Interceptor Wells
- Denitrification Bioreactor
- Both Interceptor Wells & Bioreactor

Enter Farming Practices for Sod Operation

Scenario 1 - Previous or Current Practices			Scenario 2 - Current or Proposed BMP (NOI) Practices			Note: Diff. Flag* ↓
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 SOURCE Type of Fertilizer Being Used?	Commercial Non-controlled Release		
	No Entry>			No Entry>		
	No Entry>			No Entry>		
Enter Percent of applied as Granular?	100%		Enter Percent of applied as Granular?	100%		
RIGHT RATE Fertilizer Rate Method?	On-Farm Experience-Enter Rates		RIGHT RATE Fertilizer Rate Method?	On-Farm Experience-Enter Rates		
Enter Actual N Rate:	320	lbs-N/acre/year	Enter Actual N Rate:	320	lbs-N/acre/year	
Enter Actual P Rate:	80	lbs-P2O5/acre/year	Enter Actual P Rate:	80	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		Application Rates Adjusted by Growth Stage and Season?	Yes		
RIGHT APPLICATION EQUIPMENT AND HANDLING			**RIGHT APPLICATION EQUIPMENT AND HANDLING**			
Does Fertilizer spreader avoid furrow ditches?	No		Does Fertilizer spreader avoid furrow ditches?	Yes		
Percent of Fertilizer Applied via Fertigation?	50%		Percent of Fertilizer Applied via Fertigation?	50%		
Is Banding of Fertilizer on Strips Used?	Yes	Note: Banding Can Limit Runners Growth	Is Banding of Ferilizer on Strips Used?	Yes	Note: Banding Can Limit Runners Growth	
Comments>	Selected Grass Typically Does Not Have Strips after Harvest!		Comments>	Selected Grass is Typically Not Strip Harvested??		
How Often is Fertilizer Equipment Calibrated?	Every Day		How Often is Fertilizer Equipment Calibrated?	Every Day		
Proper Fertilizer Storage/Handling Facilities and Training Procedures in Place?	Yes		Proper Fertilizer Storage/Handling Facilities and Training Procedures in Place?	Yes		
Phosphorus Soil Test Results			**Phosphorus Soil Test Results**			
Latest P Soil Test:	Enter Soil P Data		Latest P Soil Test:	Enter Soil P Data		
	200 mg/kg = ~ 400 lbs-P/ac			200 mg/kg = ~ 400 lbs-P/ac		
Irrigation Management:			**Irrigation Management:**			
Irrigation Method?	Seepage - Furrow Ditches		Irrigation Method?	Seepage - Furrow Ditches		
Scheduling Method?	Irrigation Pass-thru Detection		Scheduling Method?	Irrigation Pass-thru Detection		
No Data Entry=>			No Data Entry=>			
Irrigation Pass-thru Flow Management? =	Pass-thru Irrigation Flow Allowed		Irrigation Pass-thru Flow Management? =	Pass-thru Irrigation Flow Minimized		
Tailwater Recovery for Irrigation Reuse?	No		Tailwater Recovery for Irrigation Reuse?	No		
No Data Entry =>			No Data Entry =>			
Drainage Management:			**Drainage Management:**			
No Data Entry =>		<Not for Your Soil Type	No Data Entry =>		<Not for Your Soil Type	
Select Drainage Practice	In-Field Furrow Ditches		Select Drainage Practice	In-Field Furrow Ditches		
Field Laser Leveled?	Yes		Field Laser Leveled?	Yes		
Are Harvesting Strips Directly Down Slope?	Yes		Are Harvesting Strips Directly Down Slope?	Yes		

BMPAT RESULTS

For

' SOD FARM SOUTH - Bermuda Field A'

6/7/2020

Estimated Discharge, Nutrient Loads, and Associated Reductions

Item	Units	Scenario 1 Practices	Scenario 2 Practices	Change	
				Value	Percent
Runoff	**in/yr**	**15.64**	**14.34**	**-1.30**	**-8%**
Recharge	**in/yr**	**0.48**	**0.44**	**-0.04**	**-8%**
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 Annual Farm Income	Cost Effectiveness ($/lb Removed)	
($/ac/yr)	N	P
-$2	$1	$7

QUESTIONS

DBOTTCHER@SWET.COM