

The Number One Soil Fertility Problem in Rice

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LATMC 2017

Major Fertility Problems

- The lack of a current or any soil analysis
- Failure to follow recommendations
 - Sample 10 fields
 - Use one blend on all
- Variations in sampling methods
- Variations in recommendations

Summary Page from Nutrient Management Program

Field	Current Rotation	Current Crop	N Units Currently Applied (lb/ac)	P Units Currently Applied (lb/ac)	K Units Currently Applied (lb/ac)	Additional N Units Needed (lb/ac)	Additional P Units Needed (lb/ac)	Additional K Units Needed (lb/ac)	Excess Fertilizer Applied?*
1	rice/soybeans	rice	---	---	---	0	0	0	NO
6	rice/soybeans	rice	---	---	---	0	0	0	NO
3	rice/soybeans	rice	158	33	100	0	0	20	YES
7	rice/soybeans	rice	158	33	100	0	29	20	YES
8	rice/soybeans	rice	158	33	100	0	0	20	YES
6	rice/soybeans	rice	158	33	100	0	0	20	YES
9	rice/crawfish	rice	158	33	100	0	58	20	YES
14	rice/soybeans	rice	125	43	90	25	48	30	NO
20	rice/soybeans	rice	158	33	100	0	58	20	YES
27	rice/soybeans	rice	140	33	100	10	58	20	NO

Summary Page from Nutrient Management Program

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27	rice/soybeans	rice	140	33	100	10	58	20	NO

8 Fields

2 Blends

6 Fields Excess

Fertilizer

Summary Page from Nutrient Management Program

rice/crawfish	rice	110	60	60	31	26	10	NO
rice/crawfish	rice	110	60	60	31	26	10	NO
rice/crawfish	rice	110	60	60	31	26	10	NO
rice/crawfish	rice	110	60	60	31	26	10	NO
rice/crawfish	rice	202	60	60	0	30	60	YES
rice/crawfish	rice	202	60	60	0	30	60	YES
rice/crawfish	rice	202	60	60	0	30	60	YES
rice/crawfish	rice	202	60	60	0	30	60	YES

Summary Page from Nutrient Management Program

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rice/crawfish	rice	202	60	60	0	30	60	YES
rice/crawfish	rice	202	60	60	0	30	60	YES
rice/crawfish	rice	202	60	60	0	30	60	YES
rice/crawfish	rice	202	60	60	0	30	60	YES

7 Fields

2 Blends

4 Fields Excess

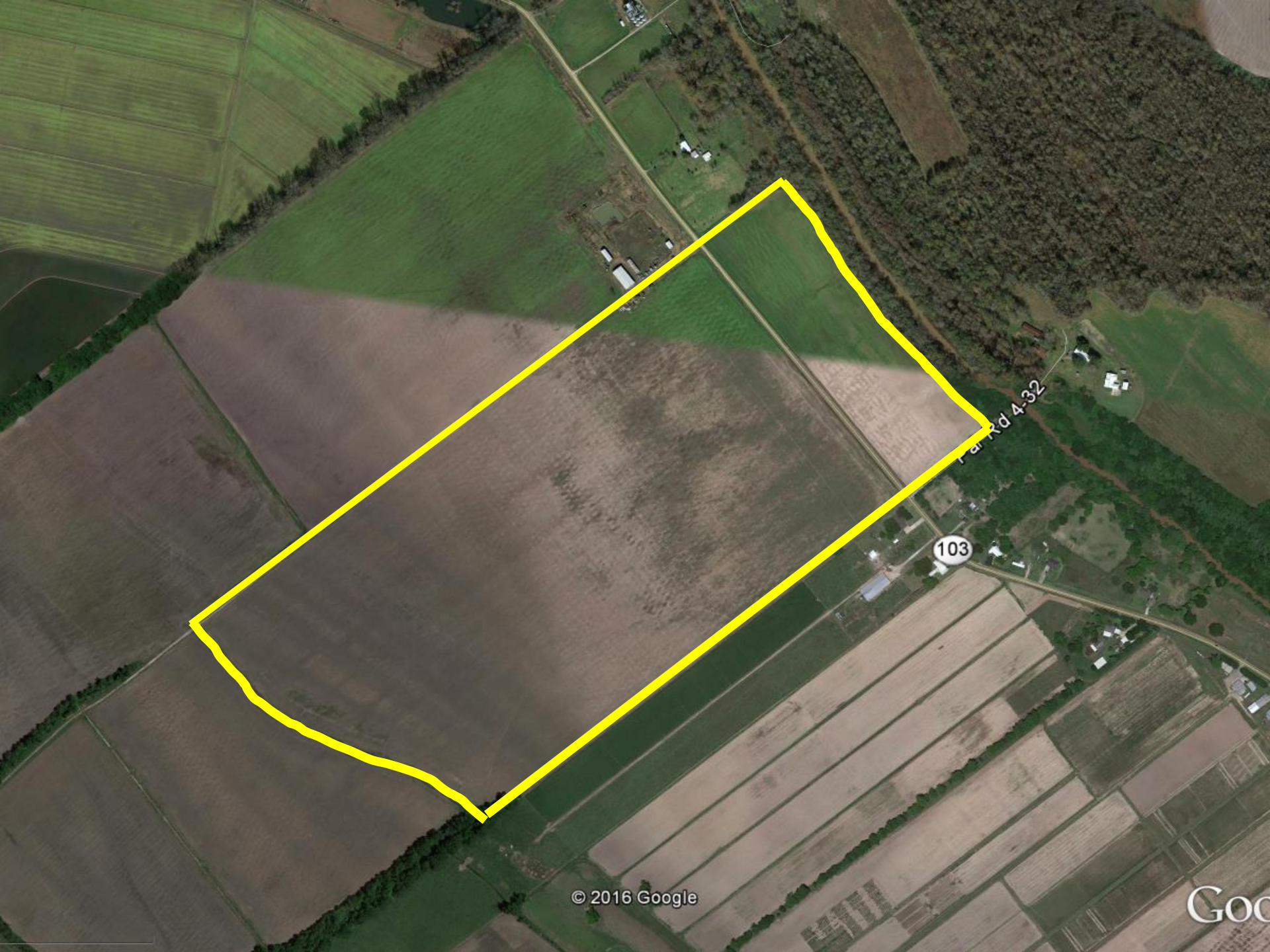
Fertilizer

Variations in Sampling Methods and Philosophy

**According to Dr. Eddie
Funderberg the greatest
error in soil testing and
fertilizer recommendation is
sampling error.**

Philosophies in soil sampling

- **Composite sample**
 - Entire field sampled randomly
 - Soil mixed to produce single sample
- **Area or Zone Sampling**
 - Identify different soil types
 - Identify patterns
- **Grid Sampling**



Par Rd 4-32

103

**Traditional
sampling
method – one
composite
sample**



Area Sampling

- Also called zone sampling
- Results in smaller composite samples
- Areas can be defined by gps locations
- Variable rate application possible



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The simple yet powerful way to access and use soil data.



Welcome to Web Soil Survey (WSS)



Web Soil Survey (WSS) provides soil data and information produced by the National Cooperative Soil Survey. It is operated by the USDA Natural Resources Conservation Service (NRCS) and provides access to the largest natural resource information system in the world. NRCS has soil maps and data available online for more than 95 percent of the nation's counties and anticipates having 100 percent in the near future. The site is updated and maintained online as the single authoritative source of soil survey information.

Soil surveys can be used for general farm, local, and wider area planning. Onsite investigation is needed in some cases, such as soil quality assessments and certain conservation and engineering applications. For more detailed information, contact your local [USDA Service Center](#) or your [NRCS State Soil Scientist](#).

Four Basic Steps

1

Define

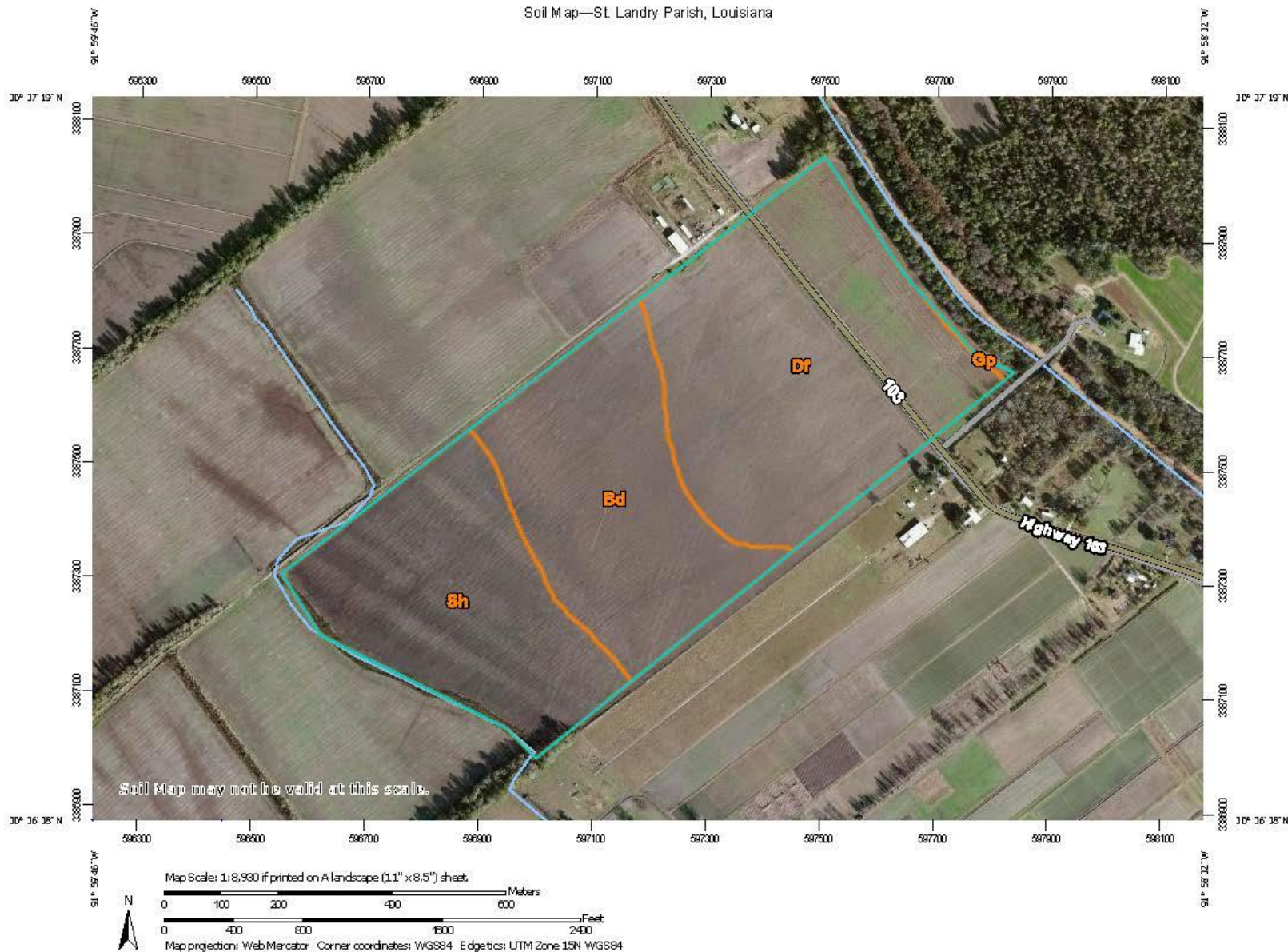
I Want To...

- [Start Web Soil Survey \(WSS\)](#)
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- [Know the Web Soil Survey hours of operation](#)
- [Find what areas of the U.S. have soil data](#)
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- [Know how to hyperlink from other documents to Web Soil Survey](#)
- [Know the SSURGO data structure](#)

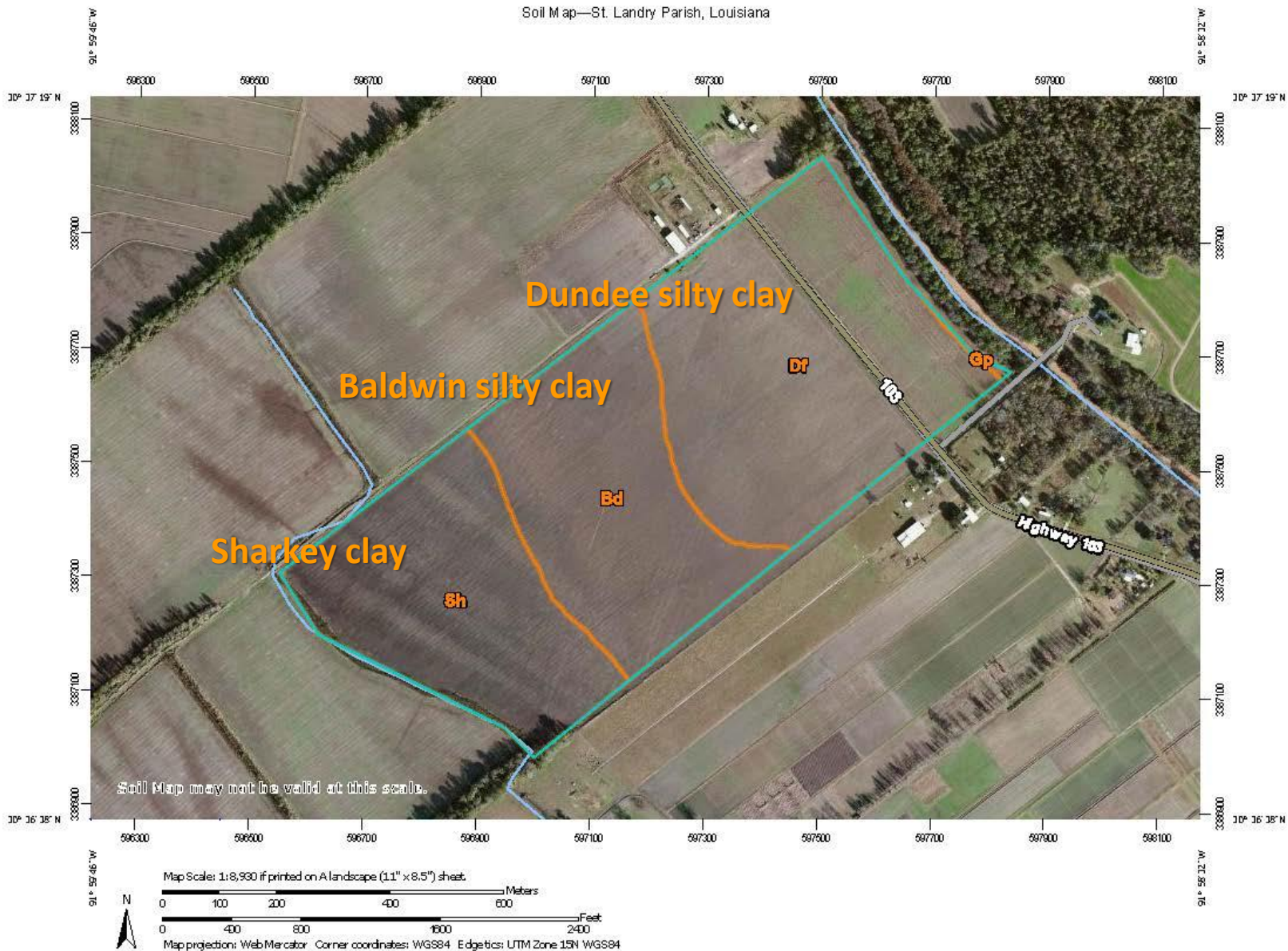
Announcements/Events

- [Web Soil Survey 3.2 has been released! View description of new features and fixes.](#)

Soil Map—St. Landry Parish, Louisiana



Soil Map—St. Landry Parish, Louisiana




Map Unit Legend


St. Landry Parish, Louisiana (LA097)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Bd	Baldwin silty clay loam, 0 to 1 percent slopes	41.5	28.5%
Df	Dundee silty clay loam	62.3	42.8%
Gp	Gallion-Perry complex, gently undulating	0.3	0.2%
Sh	Sharkey clay, 0 to 1 percent slopes, rarely flooded, south	41.5	28.5%
Totals for Area of Interest		145.6	100.0%


MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)


Soils

 Soil Map Unit Polygons


 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit


 Clay Spot


 Closed Depression

 Gravel Pit


 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp


 Mine or Quarry


 Miscellaneous Water


 Perennial Water

 Rock Outcrop


 Saline Spot


 Sandy Spot

 Severely Eroded Spot


 Sinkhole

 Slide or Slip


 Sodic Spot

 Spoil Area

 Stony Spot


 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features


 Streams and Canals

Transportation

 Rails


 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

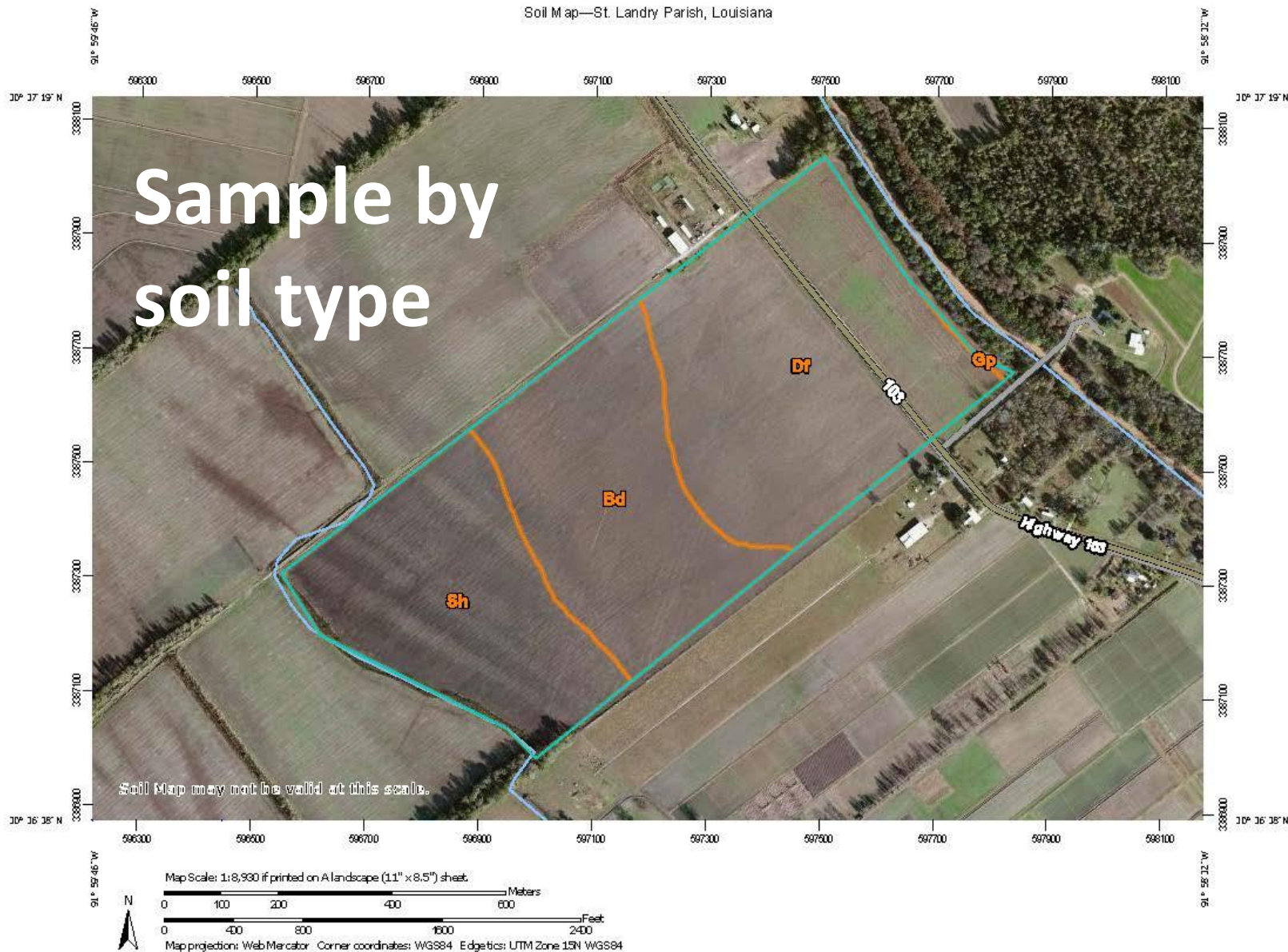
This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: St. Landry Parish, Louisiana
Survey Area Data: Version 10, Sep 28, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 3, 2010—Feb 5, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.



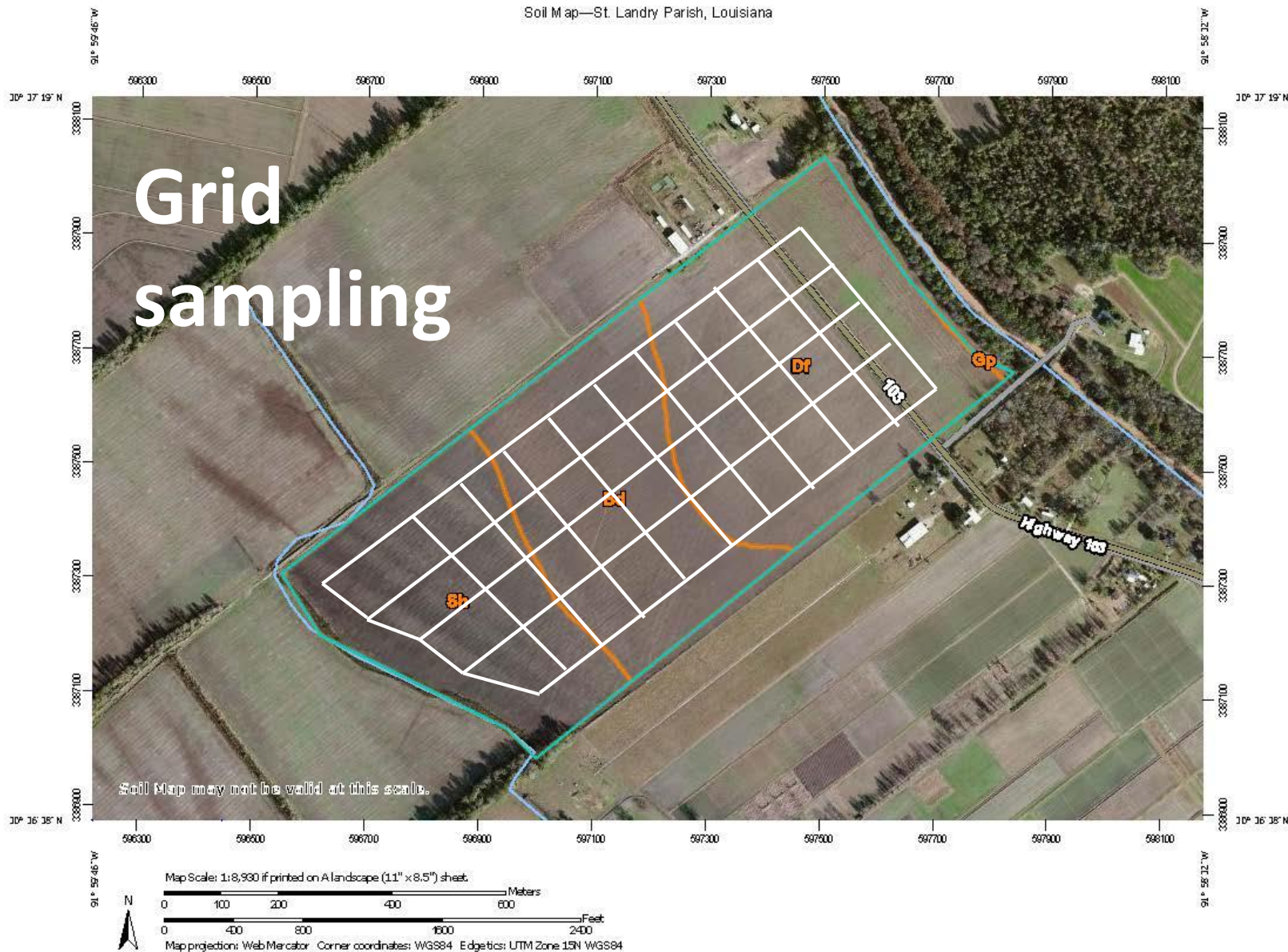
Sample by
soil type

Area or Zone Sampling

- Sample each soil type
- Develop recommendation for each sample
- Program applicator to apply prescription rate
- In this case
 - 3 samples
 - 3 recommendations
 - 3 blends

Grid Sampling

- Layout grid pattern on field
- Very precise if sampled correctly
- Time consuming
- Expensive
- Justified **if** variation in field
- Unnecessary **if** field uniform



Grid Sampling

- Approximately 55 samples
- 2.5 acre grid or every 330 ft
- 55 analyses
- Recommendations based on zone
- Application rate variable

Recommendation Philosophies

- Crop response
- Replacement only
- Build and maintain
- Nutrient ratio

Crop Response

- **Primary method for Nitrogen**
- **Necessary where nutrient deficiency noted**
- **Based on history and/or knowledge of crop/field**

Replacement Only

- Typical of Land Grant University
- Must know nutrient removal by crop yield unit
- Example: Rice
 - 1.08 lb P_2O_5 per barrel (0.3 lb per bu)
 - 0.58 lb K_2O per barrel (0.16 lb per bu)

Build and Maintain

- Replacement rate plus amount to maintain medium level in soil
- For each **20** lbs P_2O_5 removed from soil test value drops 1 ppm
- For each **6** lbs K_2O removed from soil test value drops 1 ppm

Phosphorus Example

- 50 bbl (180 bu)/A intended yield
- Crop removal $1.08 \times 50 = 54$ lbs/A
- Desired medium soil test value 28 ppm
- Actual soil test value 10 ppm
- Need 18 ppm or 36 lbs/A to get to medium
- Total needed $54 + 36 = 90$ lbs/A
- LSU rec on this soil 50 lbs/A

Potassium Example

- 50 bbl (180 bu)/A intended yield
- Crop removal $.58 \times 50 = 29$ lbs/A
- Desired medium soil test value 160 ppm
- Actual soil test value 113 ppm
- Need 47 ppm or 94 lbs/A to get to medium
- Total needed $29 + 94 = 123$ lbs/A
- LSU rec on this soil 40 lbs/A

Nutrient Balance

- In theory certain percentage of each nutrient in soil
- No actual proof of this
- Sometimes impossible to obtain
 - Eg. Magnesium in some LA soils extremely high
 - To obtain desired Ca:Mg ratio would require tons of dolomitic limestone per acre

