AN AGRONOMISTS (& FARMER'S) PERSPECTIVE ON BIOSOLIDS MANAGEMENT

TILTH AGRONOMY

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TILTH AGRONOMY
Growth Begins Here.

COMPANY INTRODUCTION

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- 11 FULL TIME AGRONOMISTS
- WORK IN APPROX. 18 COUNTIES
- 350 FARM CLIENTELE
- 250,000 ACRES
- CONSULT MAINLY IN EASTERN WI
- WRITE NMP'S, CNMP'S, CROP SCOUT, GPS SOIL SAMPLE, NUTRIENT AND PESTICIDE RECOMMENDATIONS

CONSULTANT- FARMER RELATIONSHIP

- INDEPENDENT CONSULTANTS
  - NO PRODUCT SALES
  - NO TIES TO ANY PRODUCT OR BRAND
  - INCOME DIRECTLY TIED TO CONSULTING, PLAN WRITING AND ADVISE
  - FARMERS HAVE ABILITY TO PURCHASE CROP INPUTS FROM ANY SUPPLIER BASED ON OUR INDEPENDENCE
- GAIN FARMERS TRUST
  - YEAR AFTER YEAR WORKING RELATIONSHIP
  - BECOME PART OF THE FAMILY
  - ATTEND WEDDINGS, FUNERALS, GRADUATION PARTIES

CONSULTANT- FARMER RELATIONSHIP

- HISTORIC APPROACH TO PHOSPHORUS MANAGEMENT
  - BY GAINING FARMERS TRUST WE CAN HAVE DIFFICULT CONVERSATIONS ABOUT SENSITIVE ISSUES
  - SOIL TESTING, MANURE TESTING TO DETERMINE HIGH P FIELDS, RESTRICT ON HIGH TEST FIELDS
  - IMPLEMENTING SNAP PLUS
  - MANAGE CROP ROTATION TO KEEP IN FORAGE COVER
  - GRASS WATERWAYS IN AREAS OF EROSION
  - COVER CROPS AND NO TILL BECOMING MORE PREVALENT
    - BENEFITS AND LIABILITIES
  - VRT FERTILIZER

BIOSOLIDS- FARMERS PERSPECTIVE

- UN SURE OF NUTRIENT VALUE AT FIRST
- AFRAID APPLICATION WILL DELAY NORMAL FARMING PRACTICES
- AFRAID WWTP/DNR WILL IMPOSE HIGHER LEVEL OF RESTRICTIONS
- USUALLY HAS NO CONTROL OR LITTLE CONTROL OVER TIMING OF APPLICATION
- COULD ASSUME BIOSOLIDS WILL PROVIDE ALL NUTRIENTS REQUIRED FOR PRODUCTION

BIO SOLIDS- CONSULTANTS PERSPECTIVE

- BIO SOLIDS TEST HIGHER IN P THAN DAIRY MANURE
- LIMITS FLEXIBILITY IN ROTATION
- NEED AN ACCURATE SAMPLE OF PRODUCT, TAKE IT AT THE FIELD
- TARGET HIGH FORAGE ROTATION
- CRITICAL TO HAVE UP TO DATE SOIL TEST
- POTASSIUM LOW IN BIOSOILDS, INCREASED COST OF PRODUCTION

BIO SOLIDS APPLICATION

Corn on Corn Fields						Crop Removal			Soil Test ppm		Adjusted Recs lb/ac			Planned Applications and Credits lb/ac			Over(+) Under(-) Adj. UW Recs lb/ac			Applications				
Name	Field Ac.	Soil Map Symbol (pred) & N Res	Prior Crop	2019 Crop	Yield Goal	P2O5	K2O	Tillage	Avg P	Avg K	N	P2O5	K2O	N	P2O5	K2O	N	P2O5	K2O	Product Name and Analysis	Rate and Method	N-P2O5-K2O credit	App Acres and Time	Total Amt
23	51.5	KhB	Corn silage	Corn silage	20.1-25	80	185	SFC	81	137	190	0	185	201	177	13	11	177	-172	28% UAN (Liquid 28-0-0) 28-0-0	5 gal Spring Unincorp	15-0-0	51.5 Entire field	258 gal
																				ESN 44-0-0	150 lb Spring Unincorp	66-0-0	51.5 Entire field	7725 lb
																				Liquid 6-24-6 6-24-6	5 gal Spring Unincorp	3-13-3	51.5 Entire field	258 gal
																				Urea 46-0-0	100 lb Spring Unincorp	46-0-0	51.5 Entire field	5150 lb
																				HDV 1073.17	12000 gal Fall Incorp	71-164-10	51.5 Spreadable	618000 gal

SNAP PLUS ROTATION VALUES

Field Name	SubFarm	FSA Trct	FSA Fld	Acres	County	Critical Soil Series & Symbol	F. Slp %	F.Slp Len ft	Below Field Slope To Water %	Dist.To Water ft	Contour/ Filters	Irrig	Tiled	Rotation	Tillage	Report Period	Field "T" t/ac	Rot Avg Soil Loss t/ac	SCI	Rot Avg PI	Soil Test P ppm	Rot P2O5 Bal lb/ac	P2O5 Bal Target lb/ac
23	Permit			51.5	Outagamie	KEWAUNEE KhB	4	200	0 - 2	1001 - 5000	No / No	No	No	Csl-Csl-As-A-A-A	FVT-SFC-NT-None-None-None	2018-2023	3	2.7	0.3	5	81	-19	0

CHALLENGES WITH BIOSOLIDS IN AGRICULTURE

- NUTRIENT VALUES ARE INCONSISTENT
- RAISES SOIL TEST P FAST
- WORKS BETTER IN A CORN SILAGE AND ALFALFA ROTATION, MORE NUTRIENTS TAKEN UP BY THE GROWING CROPS- NEED FOR COVER CROP FOR GOOD CONSERVATION
- VERY LOW TESTING IN POTASSIUM
- POTASH A RELATIVELY EXPENSIVE INPUT AT THESE CROP DEMANDS

THE PROOF IS IN THE PUDDING

Source	Test Date	Surface N	Incorporate N	P	K	% Solids
BioSolids	4/7/2015	7.7	9.1	18.8	1.3	2.7
BioSolids	1/3/2017	9.4	12.5	76.8	1.8	11.8
BioSolids	4/4/2017	4.1	5.8	31.6	1.3	5.1
BioSolids	7/12/2017	8.1	10.9	69.2	1.6	10.7
BioSolids	10/3/2017	3.3	5.9	13.7	0.8	2.3
BioSolids	1/2/2018	6.2	8.3	37.8	1.4	6.2
BioSolids	4/3/2018	5.2	8.1	16.7	2.1	2.8
BioSolids	7/10/2018	7.7	10.1	68.3	1.6	8.5
BioSolids	10/8/2018	6.8	9.5	67.7	1.3	7.5
BioSolids	10/25/2018	6.3	8.5	14.9	0.5	3.0
BioSolids	10/26/2018	8.0	10.0	12.9	0.5	2.7
Dairy	Ave. Pit 1	4.5	5.6	3.7	16.2	3.3
Dairy	Ave. Pit 2	6.1	7.5	5.8	20.7	9.7
		Surface N	Incorporate N	P	K	% Solids
	Average BioSolids	6.6	9.0	38.9	1.3	5.8
	Average Dairy Manure	5.3	6.6	4.8	18.5	6.5

EQUATING TO CROP PRODUCTION

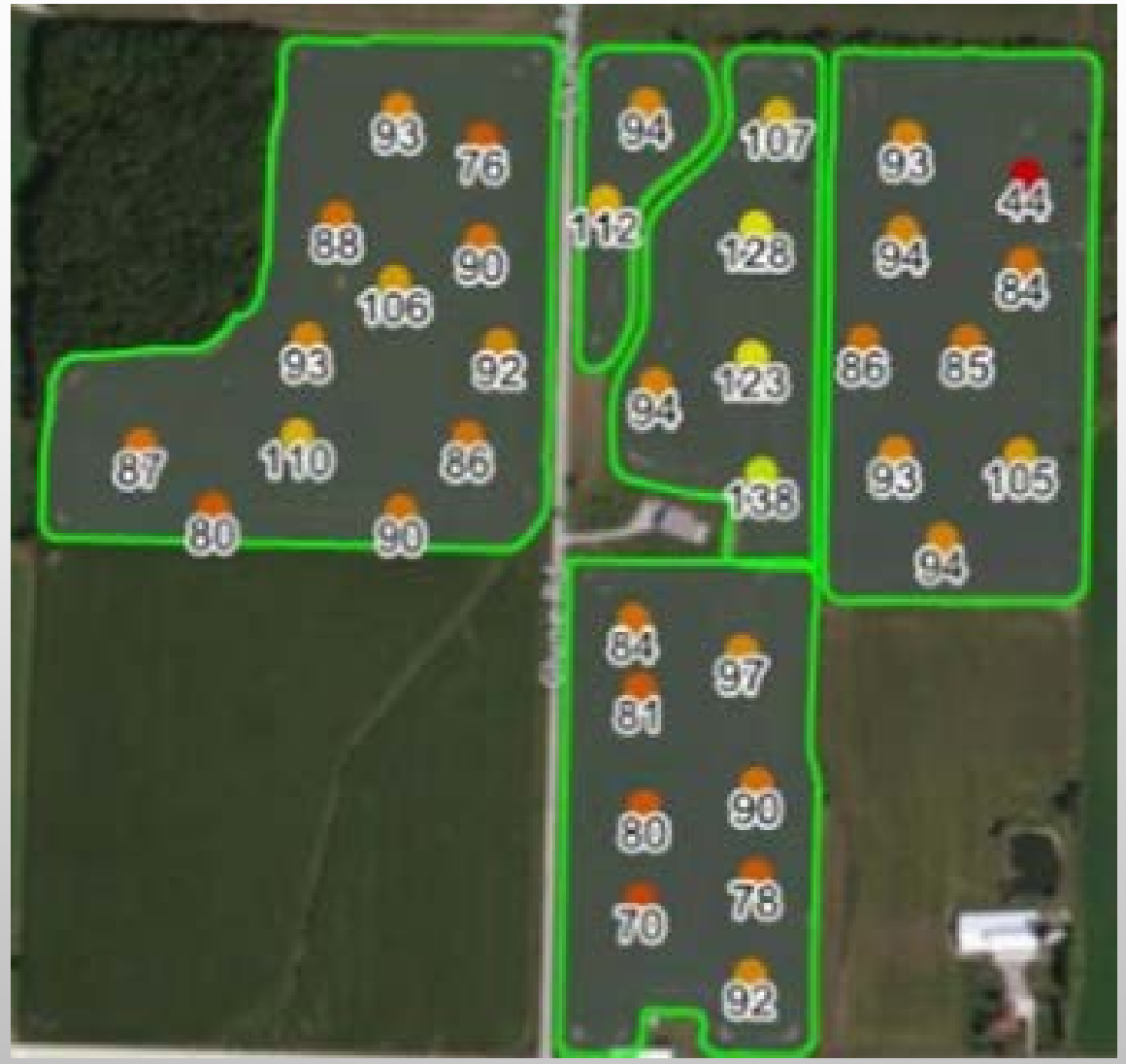
		Crop Removal vs. BioSolid Application			
		N	P	K	
Corn Silage		180	95	245	
1 yr BioSolids		108	467	16	
		-72	372	-229	Net Nutrient +/-
		Crop Removal vs. BioSolid Application			
		N	P	K	
Corn Grain		180	65	45	
1yr BioSolids		108	467	16	
		-72	402	-29	Net Nutrient +/-

HOW DO BIOSOILDS AFFECT SOIL TEST P

Field Name	Acres	Predominant Soil Name	Soil Test date	Soil Test lab	pH	OM %	P ppm	K ppm	
1	53.1	WINNECONNE	2015-10-26	AgSource	7.5	3.2	50	148	
19	54.2	WINNECONNE	2015-10-26	AgSource	6.6	3.7	44	90	
20	55.9	WINNECONNE	2015-10-26	AgSource	6.9	3.7	91	155	
21	33.6	MANAWA	2015-10-26	AgSource	7.2	2.9	79	127	
22	27.6	KEWAUNEE	2015-10-26	AgSource	6.6	2.3	96	75	
23	51.5	KEWAUNEE	2015-10-26	AgSource	6.8	3.4	81	137	
					7	3	74	122	Average
				63 Fields-Farm	7	3	32	118	Average

FIELDS BECOME VARIABLE- SOIL TEST P

SOIL TEST K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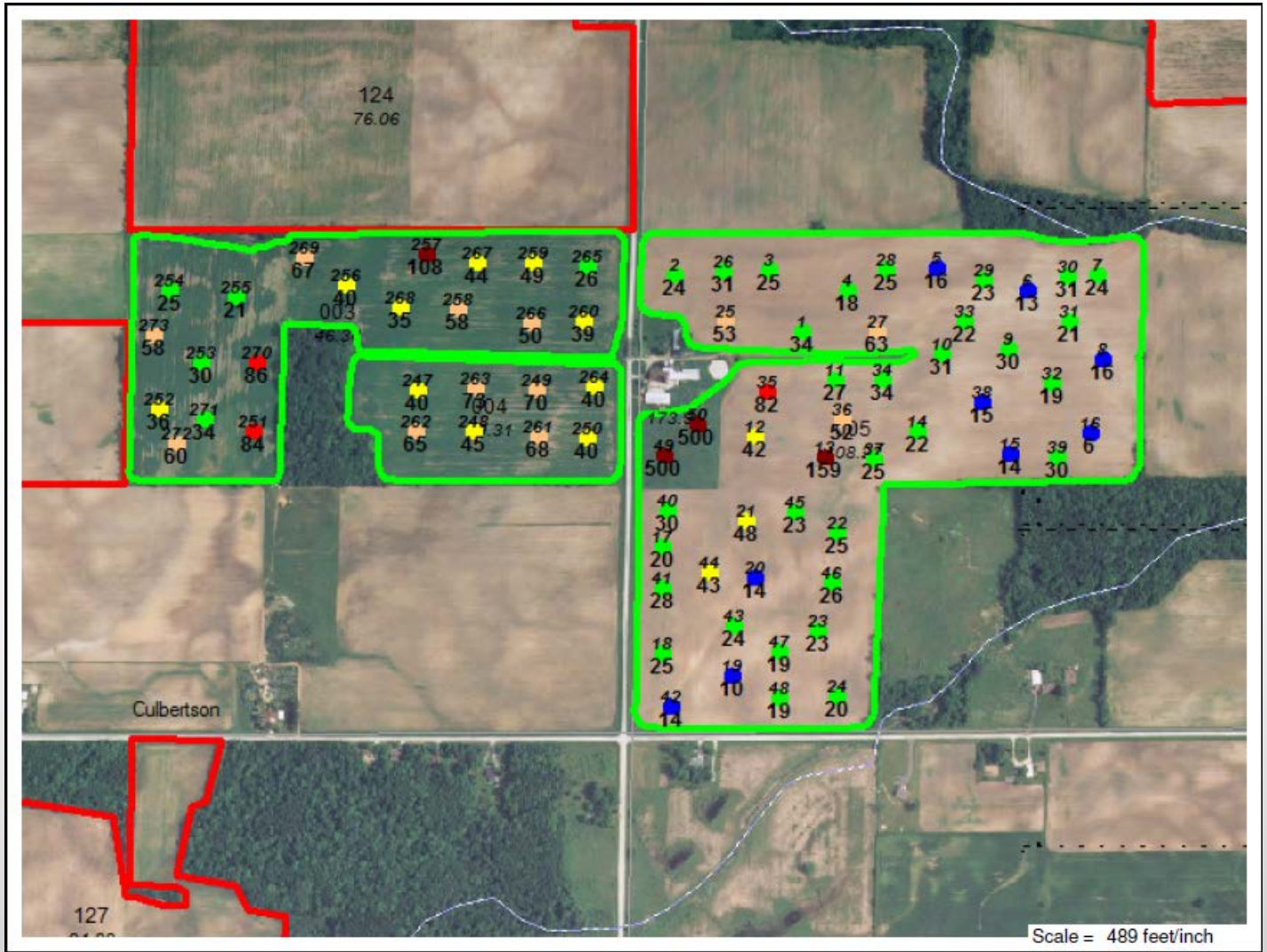
VRT FERTILIZER

- BECAUSE OF HIGH VARIABILITY IN BIOSOILDS
- PUTTING FERTILIZER WHERE IT IS NEEDED AND RESTRICTING IT WHERE IT IS NOT
- P AND K MAIN FERTILIZER VARIABLE RATE



Layer Summary

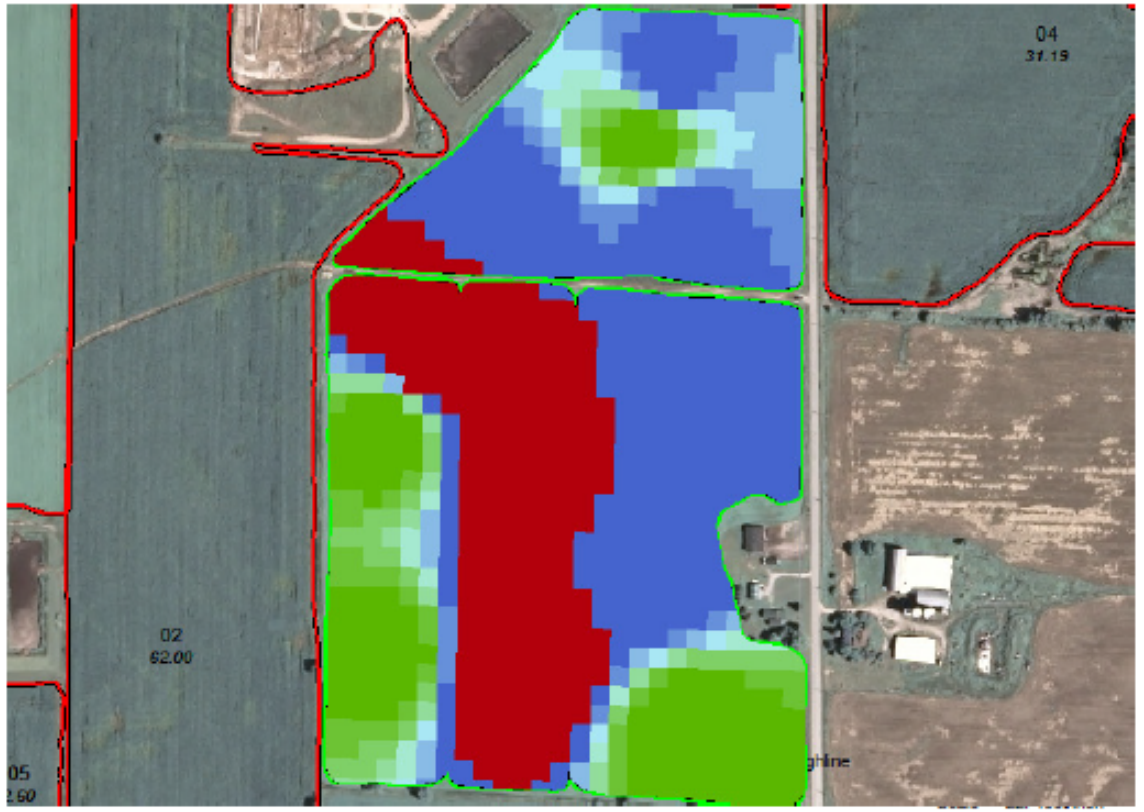
Layer:	Soil Test 2010
Attribute:	P
Records:	77
Average:	50
Weighted Average:	
Minimum:	6
Maximum:	500

P (ppm)	Sites
Below 17	9
17 to 35	36
35 to 50	14
50 to 75	11
75 to 100	3
Above 100	4

Prescription Workorder

Prepared For:
Farm:
Field: 24
Crop Zone: Alfalfa, Established
Crop Year: 2013 **Acres:** 48.99

County:
Twp Rng Sec:
Directions:



Product Summary

Operation: Spread fertilizer
Product: 11-52-0

Area (Acres)		Rate (lb/acre)	
Total:	48.98	**Average (total):**	67.00
App:	36.14	**Average (app):**	91.00
		Minimum:	0.00
		Maximum:	125.00

Quantity: 1.64 (tons)

11-52-0 (lb/acre)

0 31 63 94 125

THINGS TO PONDER!

- WILL WORK BETTER FOR A DAIRY FARMER THAN A CASH GRAIN FARMER
- SPREAD ON MORE FIELDS AND REDUCE RATES WILL REDUCE IMPACT OF HIGH P LOAD
- IF HIGHER RATES OF ARE DESIRED, REDUCE NUMBER YEARS OF APPLICATION
- HIRE A QUALITY BIOSOLIDS APPLICATION COMPANY
- COMMUNICATE, COMMUNICATE, COMMUNICATE!!!!

HOW DOES THE AGRONOMIST FIT?

- SOUND NUTRIENT MANAGEMENT PLANNING IS A MUST
- AGGRESSIVE SOIL AND BIOSOLIDS SAMPLING
- BUILD RELATIONSHIP WITH AGRONOMIST FIRST, LIAISON BETWEEN PLANT AND FARM
- LOOK TO WAPAC FOR QUALITY AGRONOMIST- WWW.WAPAC.ORG
- ADAPTATION TO THE GROWING AGE OF FARMERS- 60 YEARS OLD

QUESTIONS?

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