Zenner's 4th Gen Farm

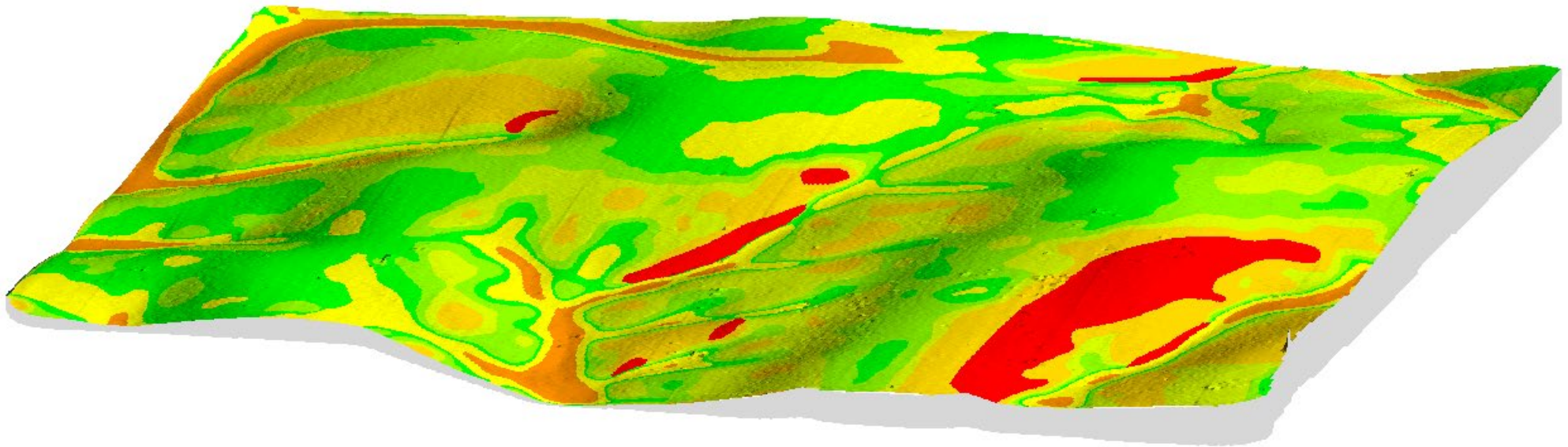
Devon Zenner

Why Are We Sitting Here Today?

- Started with wanting to maximize fertilizer Inputs
  - Adopted Variable Rate fertilizing 6 years ago
  - Reduced N and Seed in shallow ground, increased N in High Production
- Desire to build better soils by reduced tillage / no-till
  - Healthy soils cycle nutrients more efficiently
  - Healthy soils are more efficient with moisture

How Did We Get Where Were At?

- Variable Rate
  - N, P, Seed



How Did We Get Where Were At?

- Lots of soil and tissue sampling to identify true crop needs
  - Want to make educated decisions….NOT throw darts at a wall
  - Nutrient timing for best ROI

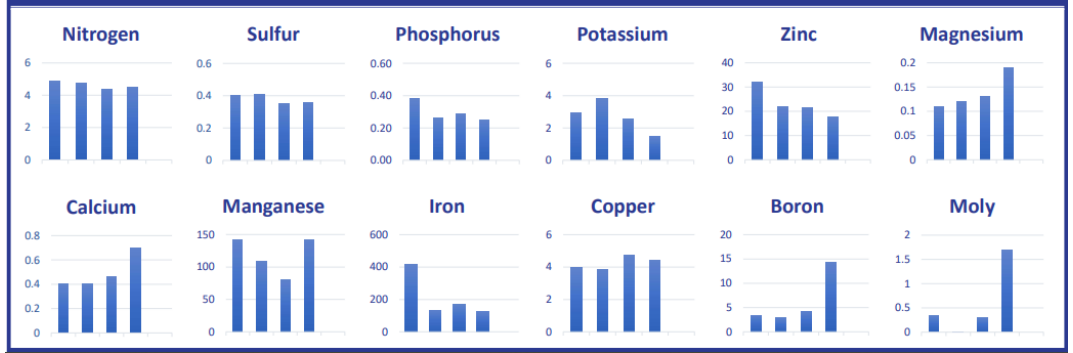
Precision Bio

GROWER:	Devon Zenner		
FIELD:		BRIAN BOHNHOFF	
ZONE ID:		(509) 432-4791	
CROP:	Winter Wheat	Brian@PrecisionbioNW.com	

DATA COLLECTION

SAMPLE DATE	CROP STAGE	N %	S %	N:S	P %	K %	N:K	Mg %	Ca %	Na %	B ppm	Zn ppm	Mn ppm	Fe ppm	Cu ppm	Al ppm	Cl %	Mo %
4/28/23	Tillering	4.87	0.4	12.18	0.38	2.92	1.67	0.11	0.4	0.004	3.45	32.08	141.9	414.9	3.95	418.4		0.34
5/22/23	Jointing	4.75	0.41	11.59	0.26	3.81	1.25	0.12	0.4	0.012	2.89	21.66	109	133.8	3.87	44.99		0.01
6/3/23	Heading & Flowering	4.4	0.35	12.57	0.29	2.56	1.72	0.13	0.46	0.006	4.28	21.26	80.62	167.4	4.73	109.8		0.3
6/28/23	Heading & Flowering	4.51	0.36	12.53	0.25	1.48	3.05	0.19	0.7	0.001	14.37	17.56	142.6	125.6	4.43	46.17		1.69

NUTRIENT TRENDS

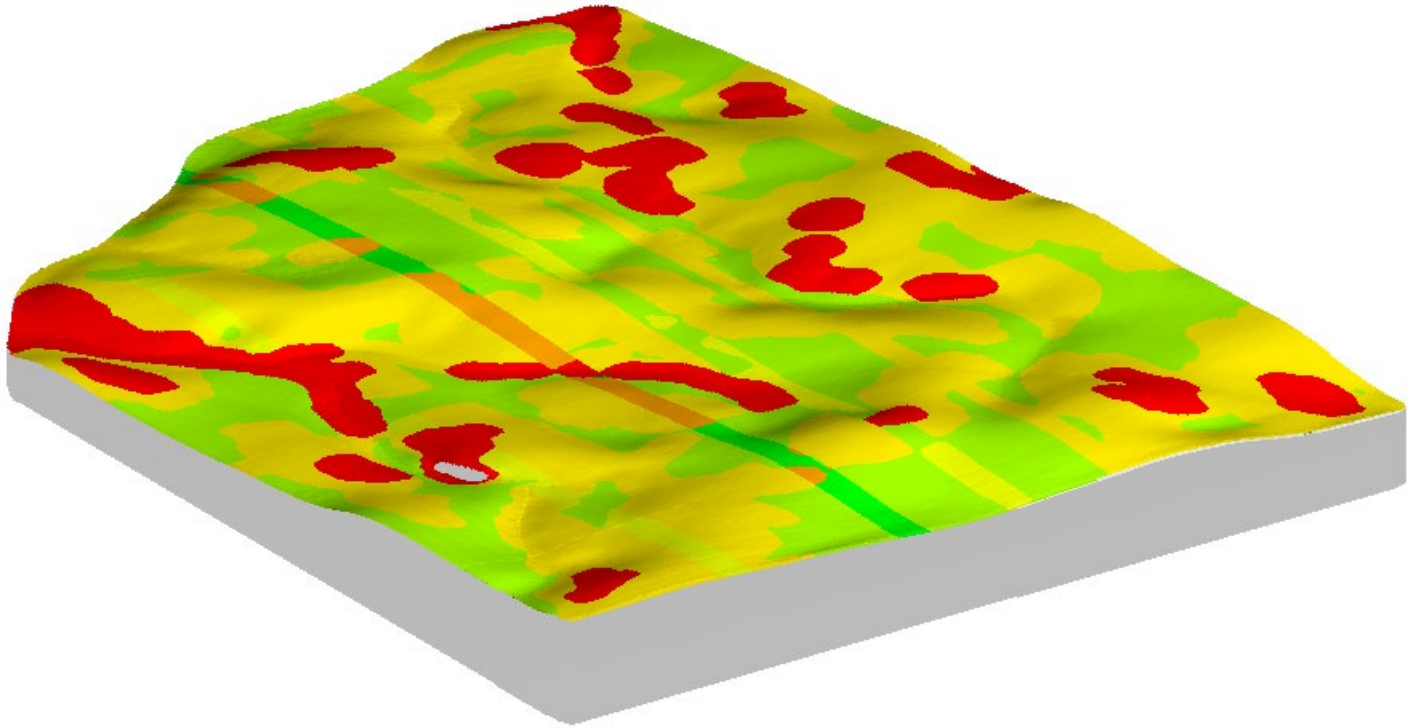


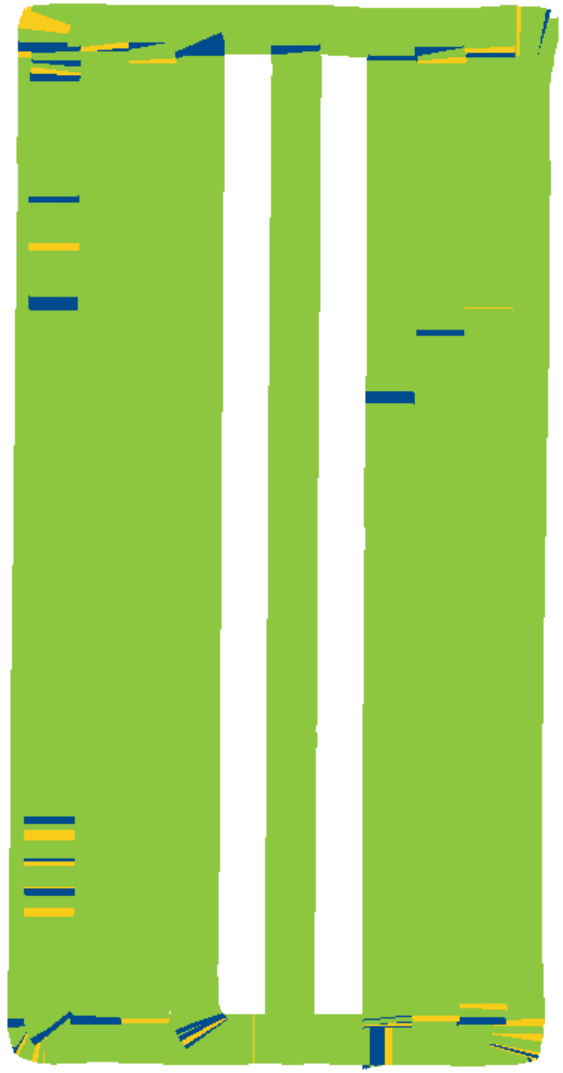
Analysis	Units	Level Found	Rating
Organic Matter	%	7.4	Very High
Nitrogen			
Surface Nitrate	lbs	23.4	
Sub Nitrate	lbs	74	
Total Nitrate	lbs	96.9	
Surface Nitrate	ppm	13.0	
Sub Nitrate	ppm	13.62	
Phosphorus			
Bray P1	ppm	34.4	Very High
Potassium			
Ammonium Acetate	ppm	459.3	Very High
Calcium			
Ammonium Acetate	ppm	1437.4	Low
Magnesium	ppm	136.5	Low
Zinc	ppm	1.4	Medium
Manganese	ppm	31.2	Very High
Iron	ppm	70.4	Very High
Copper	ppm	0.8	Medium

Analysis - Haney Extract	Units	Level Found	Rating
HT3 24 Hour CO2 Burst		50.6	
VAST	%	23.0	
Nitrogen			
KCl Nitrate	lbs	23.4	
KCl Ammoniacal	lbs	30.6	
Slan Test	ppm	56.3	
C:N Ratio		10.2	
Organic N (WEON)	lbs	8.0	
Inorganic N	lbs	54.0	
Mac WEON	lbs	8.0	
WEOC	ppm	188.1	
Total Est N-Release	lbs	54.9	
Phosphorus			
Total P H3A	ppm	20.1	Medium
P H3A (Inorganic)	ppm	15.8	
P H3A (Organic)	ppm	4.3	
Available P2O5	lbs	38.5	
P Saturation	%	6.5	High
Potassium			
H3A	ppm	172.2	Very High

How Did We Get Where Were At?

- Strip trials combining tissue sampling with yield data
  - VR management
  - Product Evaluation





How Did We Get Where Were At?

- Product Substitution
  - Foliar Amino Acids instead of Urea or 32% UAN
  - Molasses to reduce herbicide flash
  - Humic Acid instead of nitrogen stabilizer
  - Biological replacement for fungicide
  - Biological nitrogen replacement
  - Prebiotic soil stimulants

Where Are We Headed?

- Continue to reduce synthetic inputs
  - Through soil health
  - Biologicals
  - Foliar feeding
- Keep increasing nutrient use efficiency
- Constant refinement of current practices
  - VR
  - Better nutrient timing

Hasselstrom Farm

Eric Hasselstrom

Why Are We Here?

- It’s the only thing we know
- Started No-Tilling to help mitigate compaction & crusting in the tight Winchester soils
- Want to increase soil health in any way possible
  - Healthy soils are more efficient at cycling nutrients and more resistant to disease
- Seeking highest **NET** profit, not **GROSS** profit

How Did We Get Here?

- Started as No-Till with conventional Fert, Chem, Seed
- Bio-Stimulants were first step to cut synthetics & cost while also building soil health by removing salt + other crap
- Liming followed shortly to address acidity
  - Tribal Lime (very coarse)
  - Beet Lime (high in metals + high freight)
  - Grangeville Ag Lime Project (The good stuff)
- Low salt and high efficiency fert products
  - Spoon feeding vs Bulk loading

How Did We Get Here?

- Emissions System
  - Recycles tractor exhaust by injecting into ground for a carbon source and biostimulant
  - Further reduction in synthetic fertilizer & seed treat

How Did We Get Here?

- Seed Treat Elimination
  - Substituting for other stimulants/biology on seed
- Implementation of livestock & cover crops has helped kick things into gear
  - Still working on quantifying gains
- Have started to implement an organized sampling program
  - Product evaluation and informed decision making
- What weve learned so far….
  - Cu – A little goes a LONG way
  - B - Horribly low across the board
  - Zn - Always needed
  - Foliar stimulants – Reduced herbicide flash, better weed kill, disease reduction

How Did We Get Here?

Precision Bio

GROWER: Eric Hasselstrom
FIELD:
ZONE ID:
CROP: Winter Wheat

BRIAN BOHNHOFF
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DATA COLLECTION

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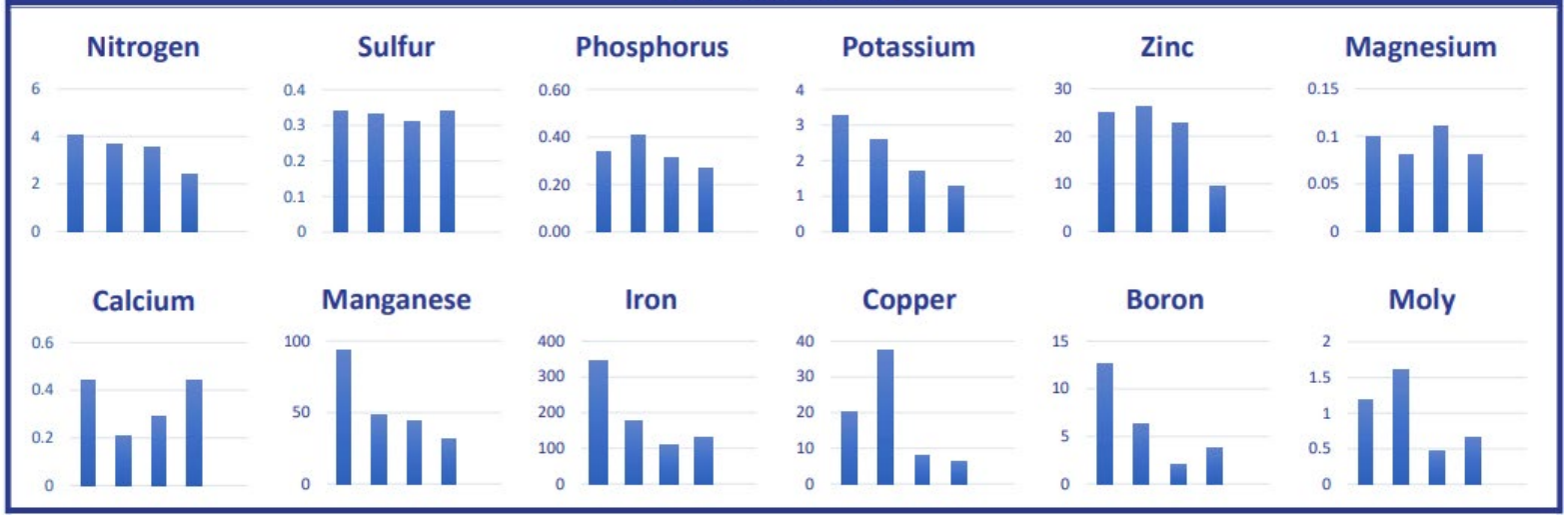
6/10/23	Jointing	3.7	0.33	11.21	0.41	2.59	1.43	0.08	0.21	0.004	6.36	26.19	48.08	176.2	37.58	105.7		1.61
6/25/23	Heading & Flowering	3.52	0.31	11.35	0.31	1.71	2.06	0.11	0.29	0.003	2.06	22.9	44	107.7	8.02	38.2		0.46
7/15/23	Heading & Flowering	2.4	0.34	7.06	0.27	1.28	1.88	0.08	0.44	0.004	3.78	9.47	31.49	129.8	6.09	44.74		0.65

NUTRIENT TRENDS



Where Are We Headed?

- 0 synthetics!
- Only pushing buttons on micros + stimulants where needed
- Quantify nutrient density for niche market penetration