

Grain sorghum fertility study

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Objectives

- Determine whether management zones are appropriate
- Determine how to define zones
- Measure effectiveness of zones

Methods

- Milo was planted on June 6th 2009
 - 30,000 seeds/ac were applied uniformly
- 7.6 Gal/ac 32-0-0 was applied 2x2
 - Uniform rate
- 10-34-0 & remaining 32-0-0 broadcast June 8th
 - Applied according to management zones
- Milo was harvested and yield was mapped using JD GS1 on November 7th and 8th 2009
 - Only 1 of the 3 combines was equipped with YM
 - Emphasis on getting grain out over good YM
 - Data was corrected using Yield Editor

Management zones

- Yield data filtered with Yield Editor
- Yield data normalized
 - Each point divided by highest yield point
 - Removes year to year bias
- Yield points averaged into 30'x30' grid
 - Header width
 - Allows for yield comparison

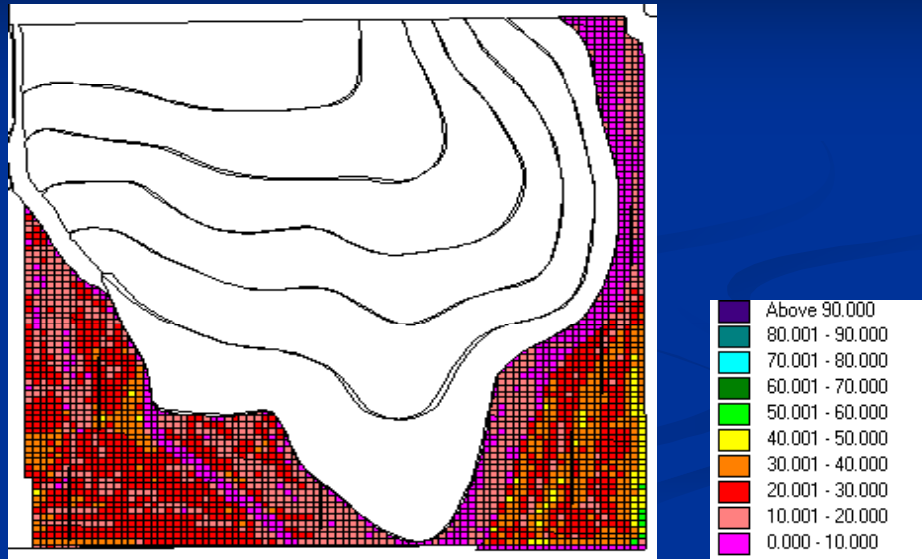
Management zones

- Yield averaged for each cell
 - Spatially join each cell across years
- Calculated standard deviation
 - Measure of yield stability
- Soil map

Fertilizer rates

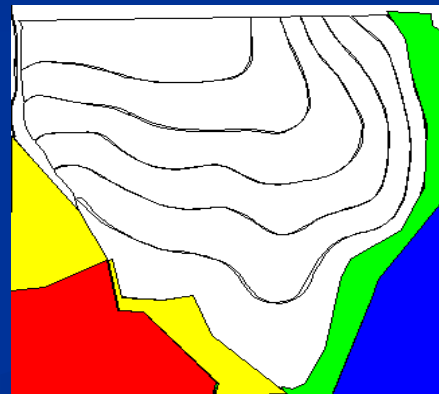
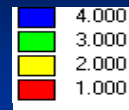
- Composite soil test taken for each zone
 - Analyzed at KSU Soil Test Lab
- Economic optimal N rate calculated
 - Using KSU-NPI_Cropbudgets
- Prescription created

5 year average yield

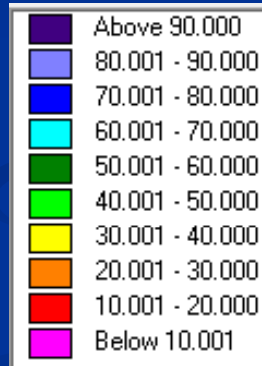
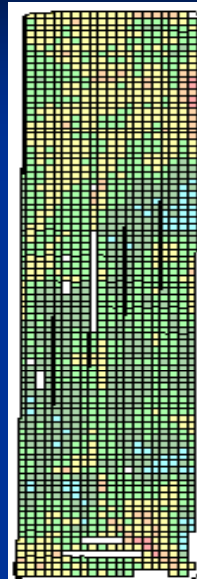


Management zones Field 1

- Zone 1
 - 67.5 lbs N/ac
 - 32 lbs P/ac
- Zone 2
 - 57.6 lbs N/ac
 - 65 lbs P/ac
- Zone 3
 - 55.6 lbs N/ac
 - 85 lbs P/ac
- Zone 4
 - 57.6 lbs N/ac
 - 85 lbs P/ac

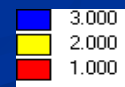


4 year yield average



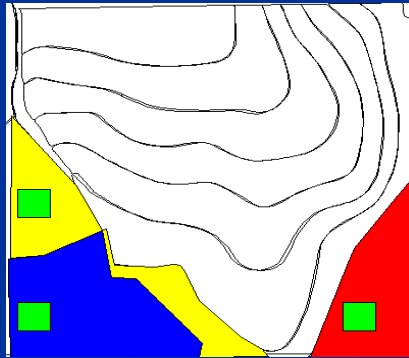
Management zones Field 2

- Zone 1
 - 53.5 lbs N/ac
 - 0 lbs P/ac
- Zone 2
 - 63.5 lbs N/ac
 - 32 lbs P/ac
- Zone 3
 - 65.5 lbs N/ac
 - 50 lbs P/ac

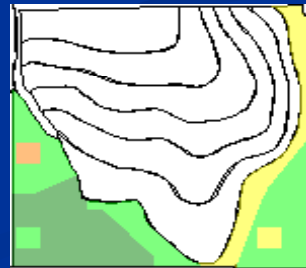
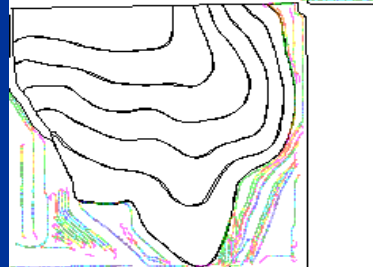
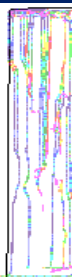
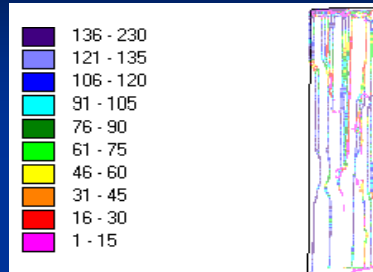


Check

- 1 ac cells
 - avg. field fertilizer level
- Field 1 check
 - 54.1 lbs N/ac
 - 32 lbs P/ac
- Field 2 check
 - 39.5 lbs N/ac
 - 65 lbs P/ac



Yield map



Results

Field 1	Total yield (bu/ac)	Check yield (bu/ac)	Yield dif. (bu/ac)		N rec (lbs N/ac)	P rec (lbs P/ac)	Profit/Loss from zones (\$/ac)		
	72	61	11		67.5	32	\$81.43		
	63	53	10		57.6	65	\$27.80		
	53	47	6		55.6	85	-\$15.60		
	72	73	-1		57.6	85	-\$35.58		
				Check	58.6	65			
Average	65	58.50	6.5				\$14.51		
Field 2	127	147	-20		53.5	0	\$2.36		
	95	141	-46		63.5	32	-\$126.04		
	84	74	10		65.5	50	-\$3.31		
				Check	63.5	32			
Average	102	120.67	-18.67				-\$42.33		

Conclusions

- Poor yield data decreases confidence
- Data suggests zones make sense
- More years of data will increase confidence
- Questions