

Creating Management Zones

**2004 KARA Conference
Manhattan Kansas**

Kansas Agricultural Research Association



Can we use soil EC to set yield goal zones?

Soil Electrical Conductivity measures areas of contrasting soil properties. Is this information useful in establishing zones for variable rate application of crop inputs?

Methodology

- **Measure soil Electrical Conductivity**
- **Take intensive soil samples**
- **Gather Yield information**
- **Analyze data**
- **Create Zones based on analysis**



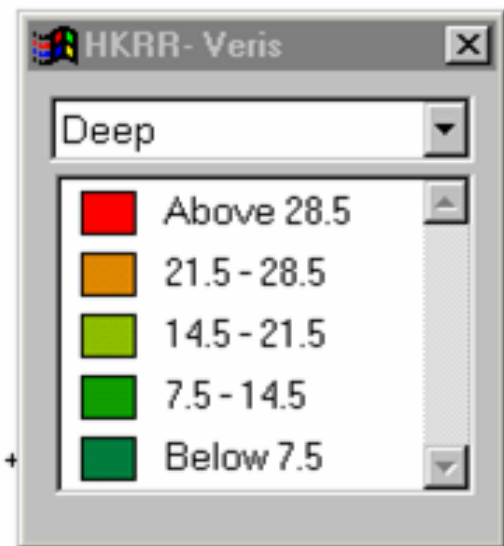
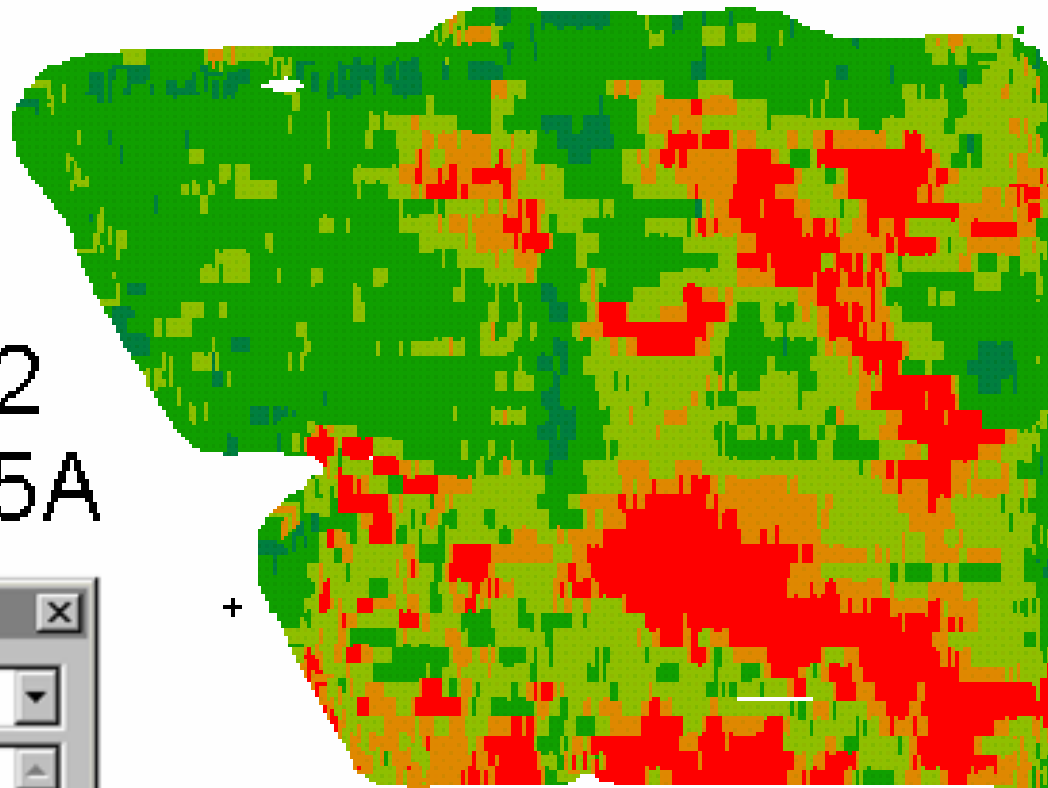
Veris. 3100

Soil Electrical Conductivity

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RR2
46.5A



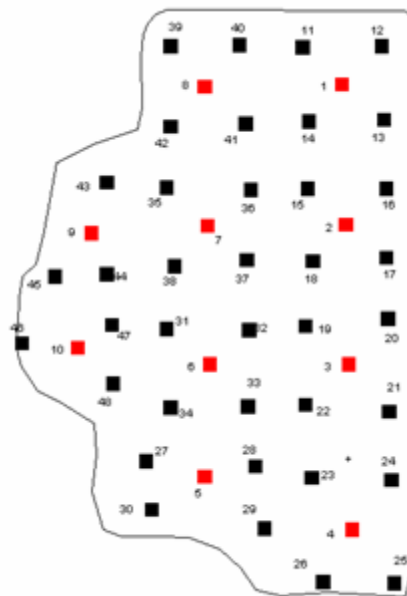
Veris Deep

Red samples = 1999

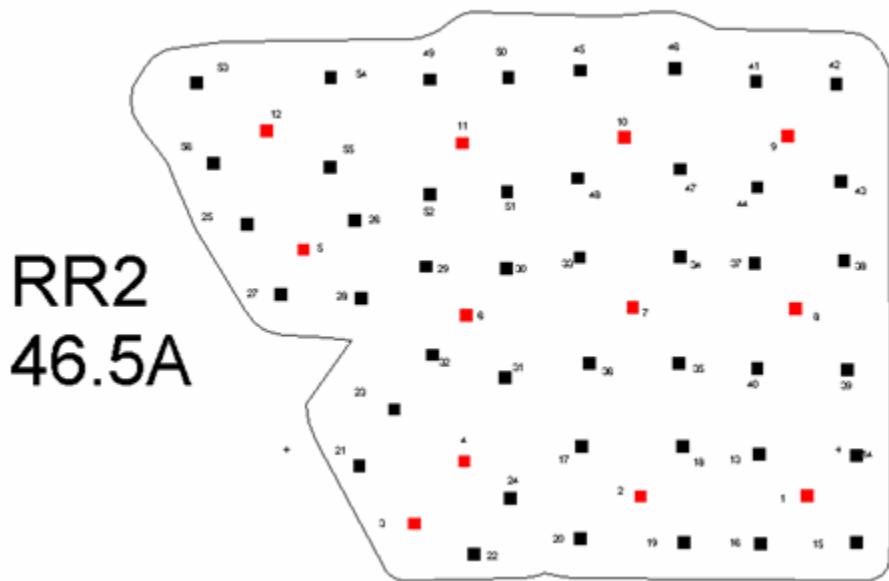
Normal grid

Black samples = 2003

Intensive grid based on EC



HK2
18.7A



RR2
46.5A

Grid Soil Samples

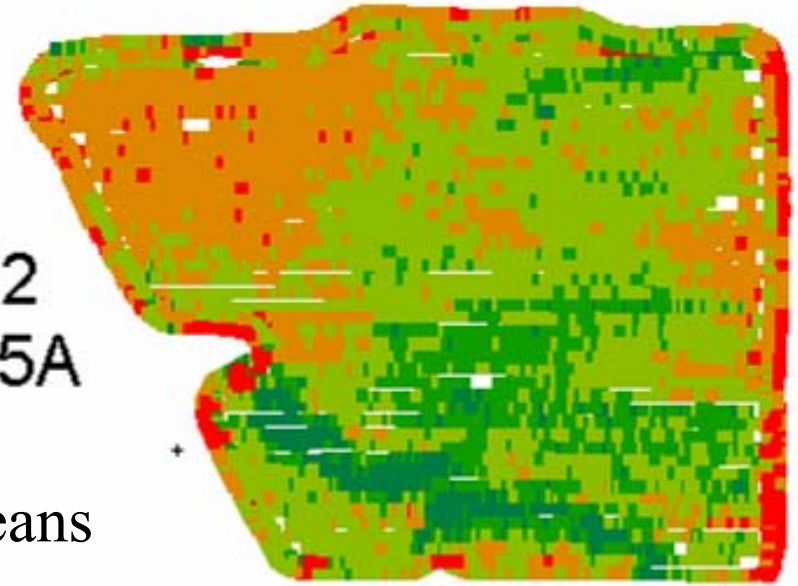
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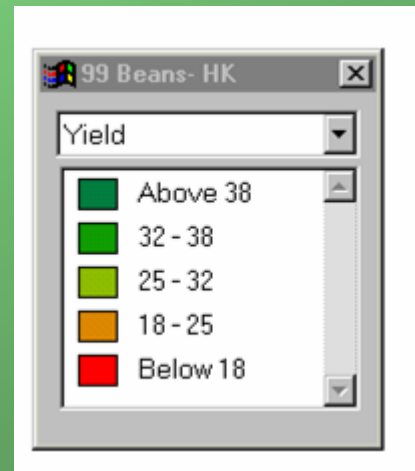
Yields

- **99 Beans**
- **01 DC Beans**
- **03 DC Beans**

RR2
46.5A
+
99 beans



- **98 Corn**
- **00 Corn**
- **02 Corn**



VR Lime Application

- **pH has almost no correlation to EC**
 - Veris will not be valuable for lime zones
- **Would EC correlate to Buffering?**
 - If so, a hand held pH meter could be used to determine pH and EC to adjust lime rates
 - Wish soil samples had more information

VR P Application

- **Good correlation of P to EC on these fields.**
 - **Other fields we have analyzed in the past have not shown this correlation**
 - **Until we see this correlation on more fields I discount this association.**

VR K Application

- **No correlation of K to EC**
 - EC not good for zone determination

Yield correlated to EC

- **Could use EC as a surrogate to Yield maps to generate VR maps on fields with inadequate yield history**
- **Probably applies to our clay pan soils only – other soils have different properties**

VR Fertilize Application

- **Use premise that higher yields remove more nutrients and therefore need more fertilizer.**
- **Medium to High testing soils replace nutrients removed by crops**
- **Low/Very low test soils removal plus build application**

VR Fertilize based on Yields

- **Figure nutrient removal for Corn, Wheat and Beans separately.**
 - **Average 3 year crop yields each grid**
 - **Factor field 3 yr average to 10 year overall farm crop average**
 - **Figure nutrient removal each grid**
 - **Add build factor for low testing grids**
 - **Calculate average nutrient needed**

Calculate Fertilize Needed

- **Three Crops in Two Years**
 - Corn one year – Wheat/Beans next
- **Add Corn + Wheat + Beans**
- **Divide by two and apply each year**
- **Apply full amount every other year**
- **Deep Place Corn – Broadcast Wheat/Beans**

Land Without Yield History

- **Use Electrical Conductivity**
 - Correlation is not 100% with yield
 - Use as alternative to yield maps
 - Base fertilizer rate off soil test
 - Adjust areas upward for low EC areas