

2004 CMDC

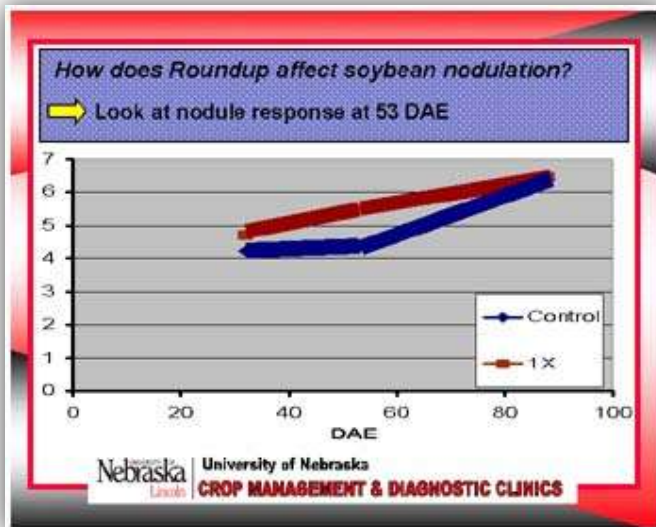
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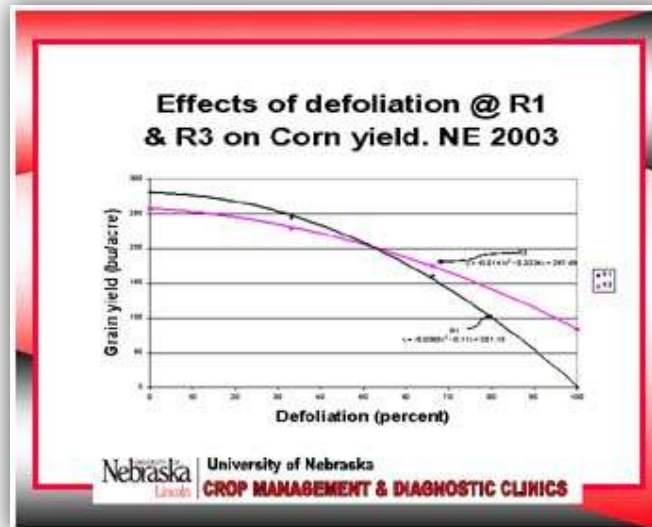
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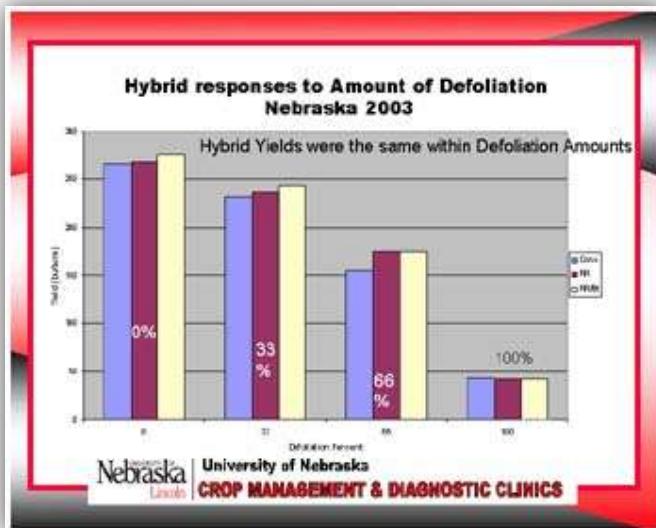
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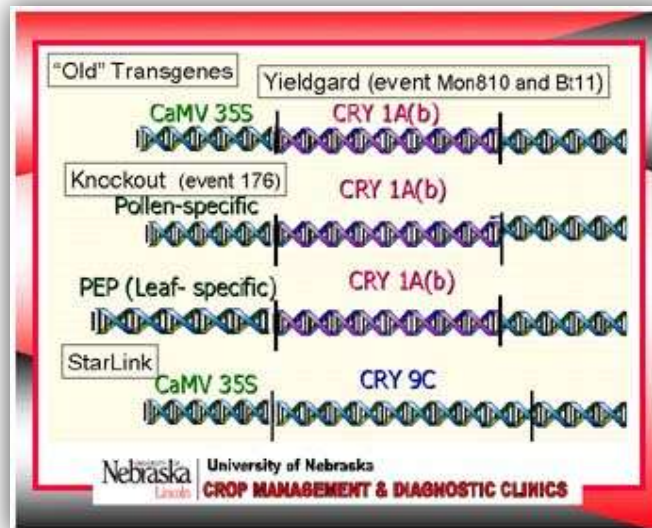
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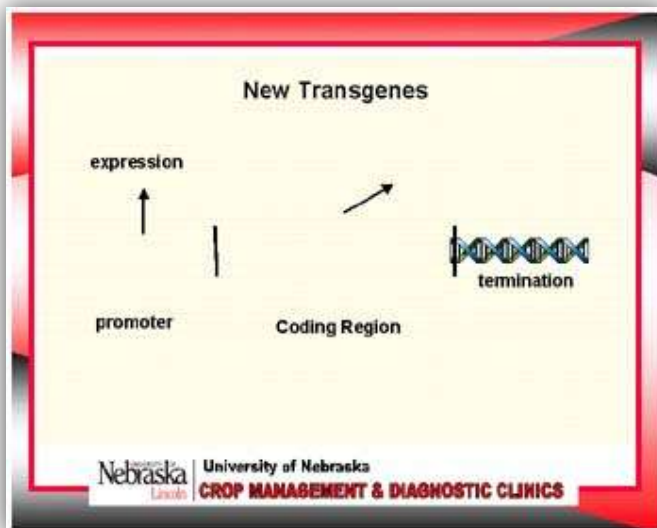
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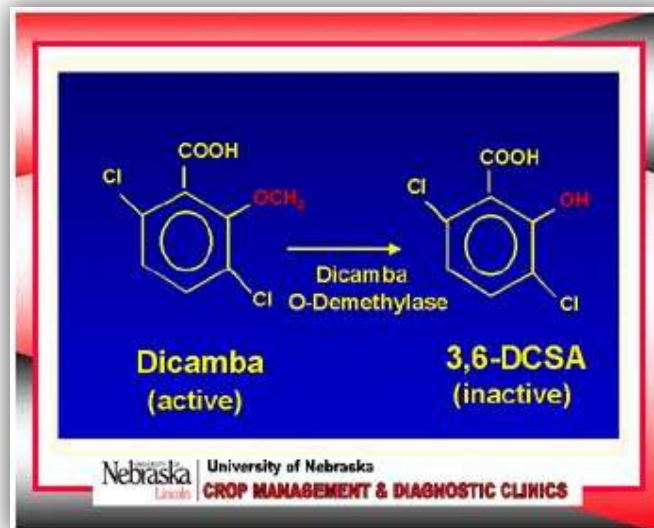
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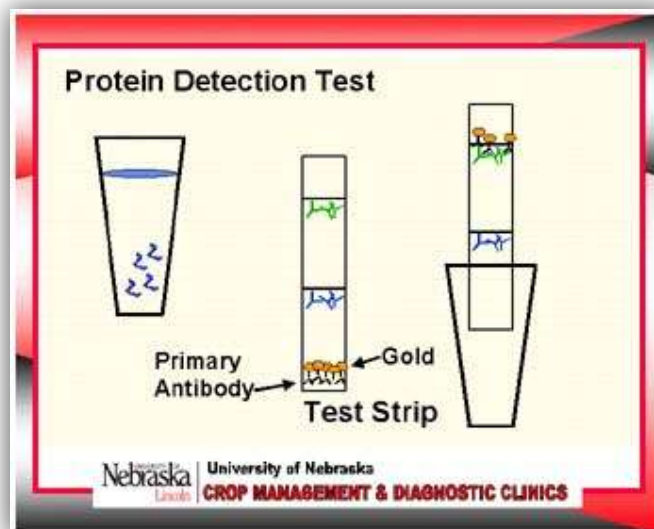
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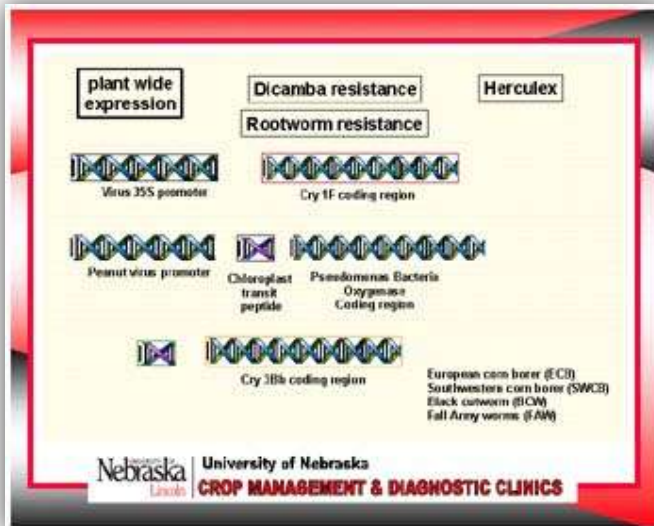
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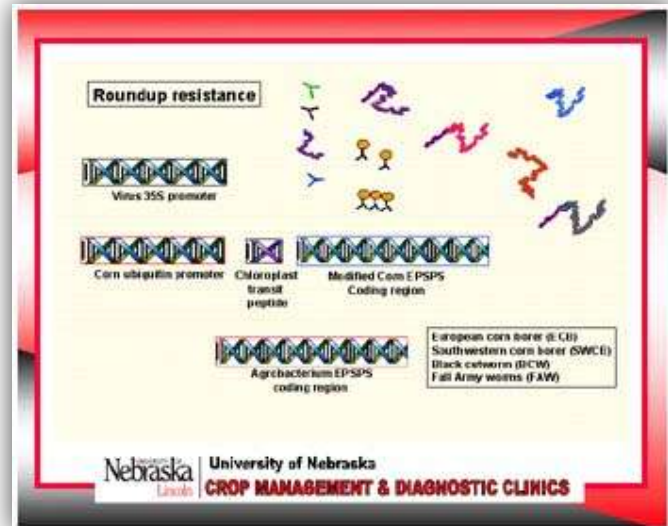
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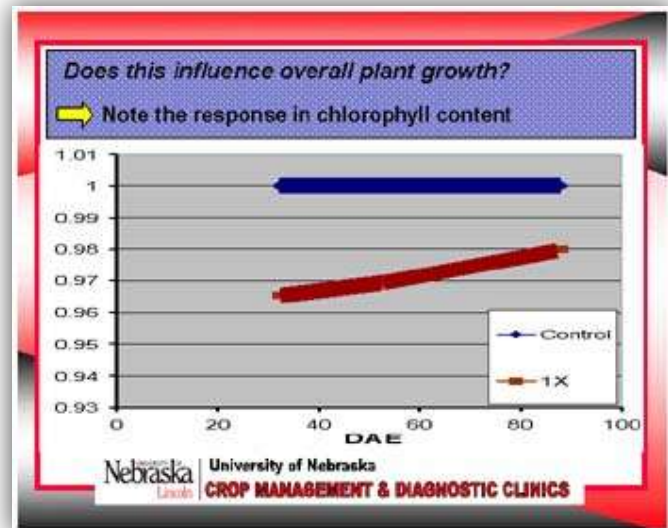
Measuring/estimating soil water status and evapotranspiration (ET) for irrigation scheduling

Why measure soil water status?

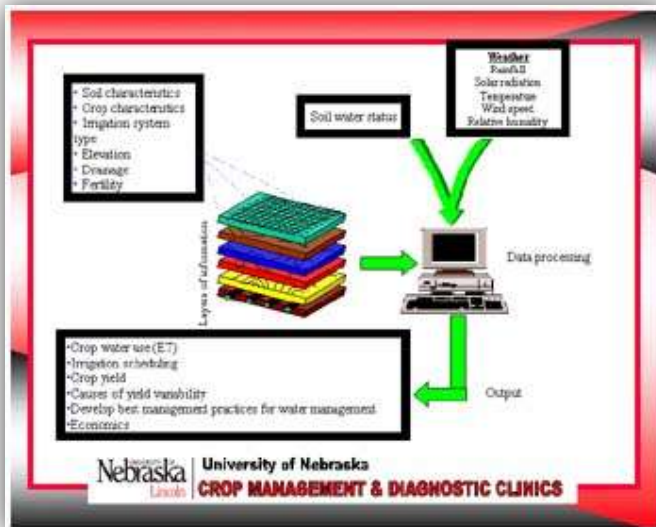
- Water conservation
- Irrigation scheduling
 - When to irrigate?
 - How much water to apply?
 - How to apply (irrigation system selection and design)?
- Reduce runoff
- Reduce chemical leaching to other water bodies
- Optimize crop yield

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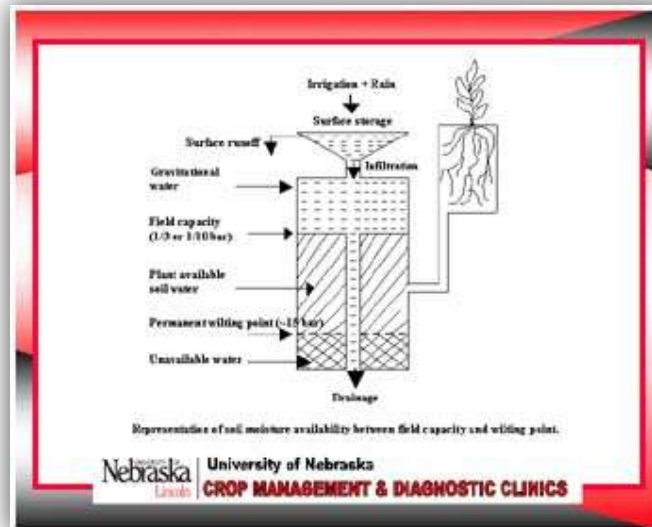
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How do we express soil water status?

- Soil matric potential (SMP)
- Soil water content (SWC)

What is soil matric potential (SMP)?

air water soil plant root

SMP is an direct indication of the energy status of the soil water
 • It quantifies how much energy (work) the plant roots have to invest to withdraw water from the soil

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How do we measure soil matric potential?

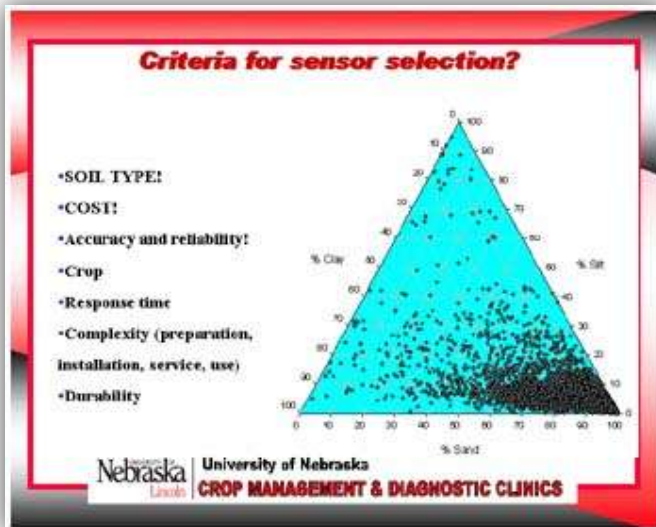
- Tensiometers
- Hygrometers/psychrometers
- Electrical resistance units (*Watermark Granular Matrix Sensors*)
- Filter paper technique
- Pressure chamber

How do we measure soil water content?

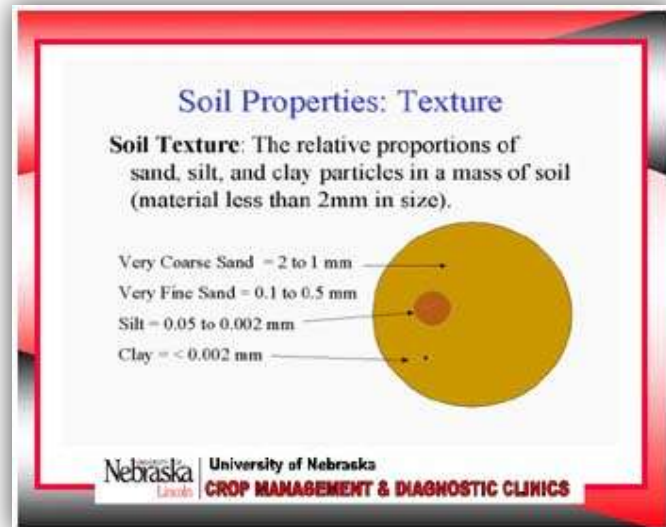
- Gravimetric sampling (direct)
- Time-domain reflectometer (TDR)
- Electrical resistance units (gypsum, *Watermark granular matrix sensors*)
- Neutron probe
- Heat dissipation
- Filter paper technique
- Remote sensing

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2004cmdc020

Physical Properties as Affected by Soil Texture

- **Porosity – Relative Pore Volume in Soil**
- **Infiltration – Downward movement of water**
- **Water Holding Capacity**
 - Permanent Wilting Point
 - Field Capacity
 - Available Water

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Soil Texture Classes

- **Sand** – Sand imparts a gritty feel to soil due to the shape of the individual particles.
- **Silt** – When moist, silt has a floury feel and does not ribbon when pressed between the thumb and forefinger due to the shape of the individual particles

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Overall Results

Nodule counts were not reduced due to Roundup

Leaf "greenness" was reduced

Yield was not affected by Roundup

Protein content in seed may be altered

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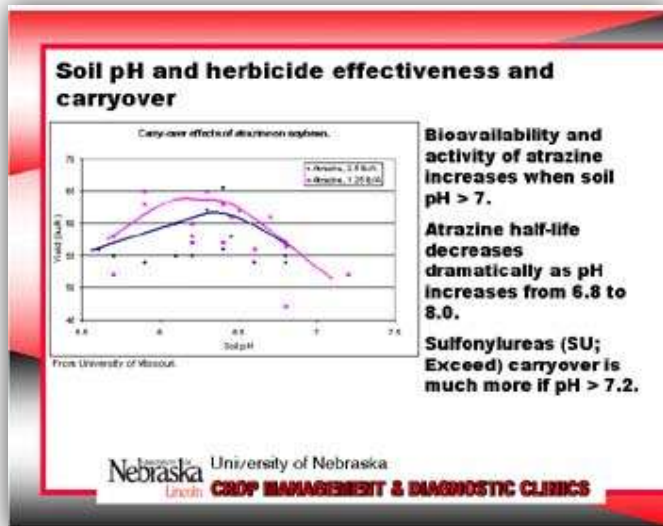
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Soil Texture Classes

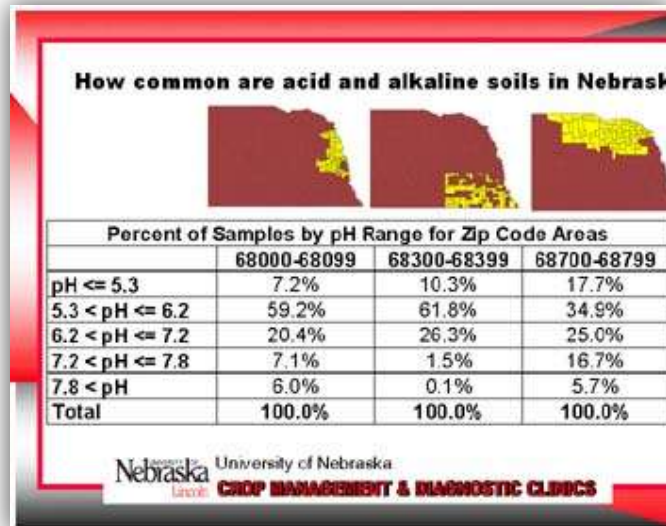
- **Clay** – Moist clay is sticky and will ribbon readily when pressed between the thumb and forefinger. When placed between the teeth clay has a smooth slick feeling.

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Timing of Weed Control & Weed Size

Weed Size and CPWC

- > If weeds emerge before crop or are taller than crop control them 4-5 days (1-2 crop leaf) before CPWC
- > If weeds emerge 5-10 days after crop, wait 5- 10 days (2-3) crop leaves to start control

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Timing of Weed Control and Weed Size

Weed Size and Herbicide Rates

- > Larger weeds need higher herbicide rates
- > Example: Glyphosate Rates
 - > Lower rate 16-24 oz (annual grass 3-8" tall, broadleaf < 4")
 - > Full rate - 32 oz grass > 8", and broadleaf 4-10"
 - > High rate - 40-64 oz (smartweed, morningglory, weeds > 12")

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Herbicide Combinations

➤ What do you expect to gain?

1. Broader Spectrum
2. Synergism

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Herbicide Combinations

➤ What do you stand to lose?

1. Antagonism
2. Crop Injury

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Herbicide Additives

➤ Gain?

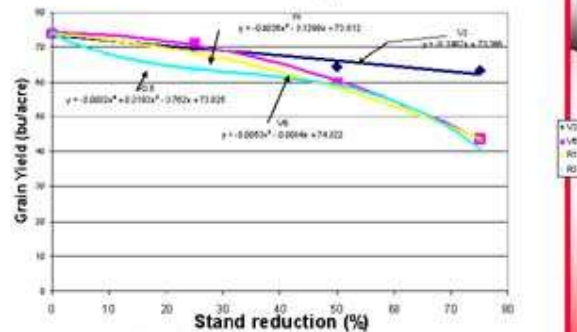
➤ Improved Performance

➤ Loss?

➤ Potential Crop Injury

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Soybean Yields Decrease with Stand Reduction, NE 2003



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