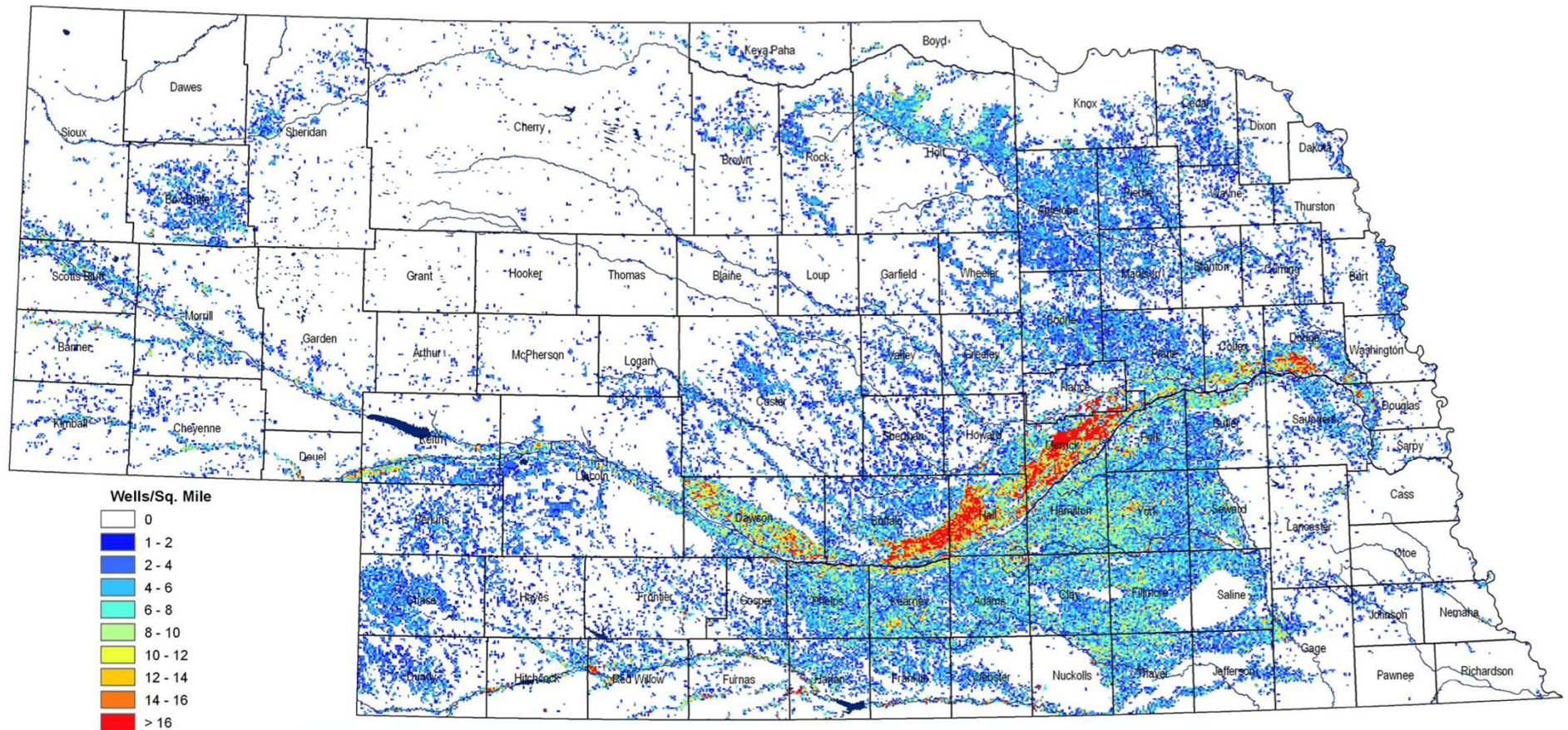




## Successful In-field Water Management in Nebraska

Jim Schepers  
USDA-ARS Soil Scientist (retired)  
University of Nebraska (emeritus)

## Density of Registered Irrigation Well in Nebraska



8.56 million acres irrigated

**>100,000 irrigation wells**

80 % under center-pivots

**~55,000 pivots**

**End – to – End**

**> 10,000 miles**

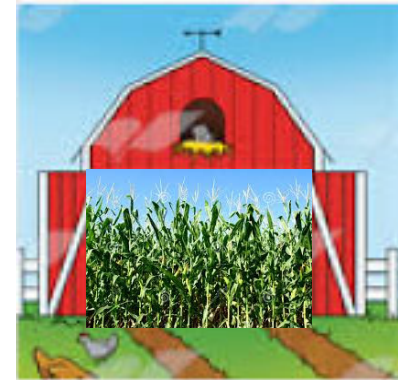


## *Sprinkler Irrigation Opens many Doors*

- Higher yields
- Stable production
- Adaptive management
- Improved NUE
- Reduced N losses
- Cover crop options
- Cleaner environment

### *But Requires :*

- Higher level of management
- Season – long involvement



## Fertigation

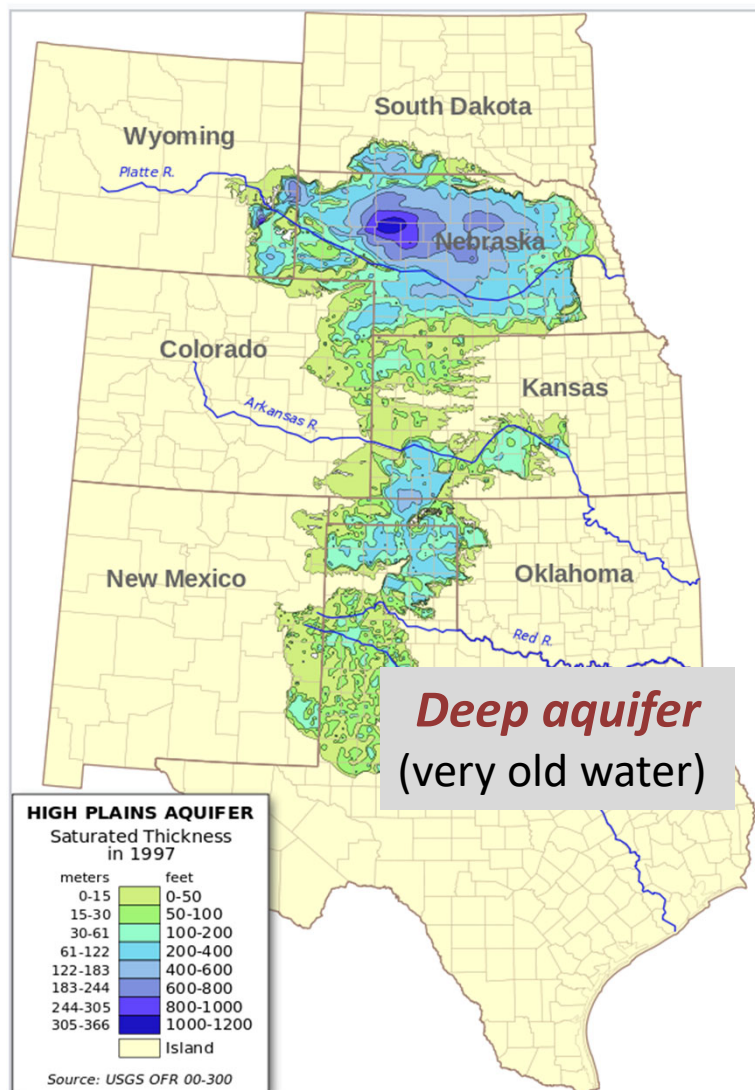
- Nitrogen
- Sulfur
- Fungicides

Chemigation  
Pump



# Sources of Irrigation Water

## *High Plains Aquifer (Ogallala)*

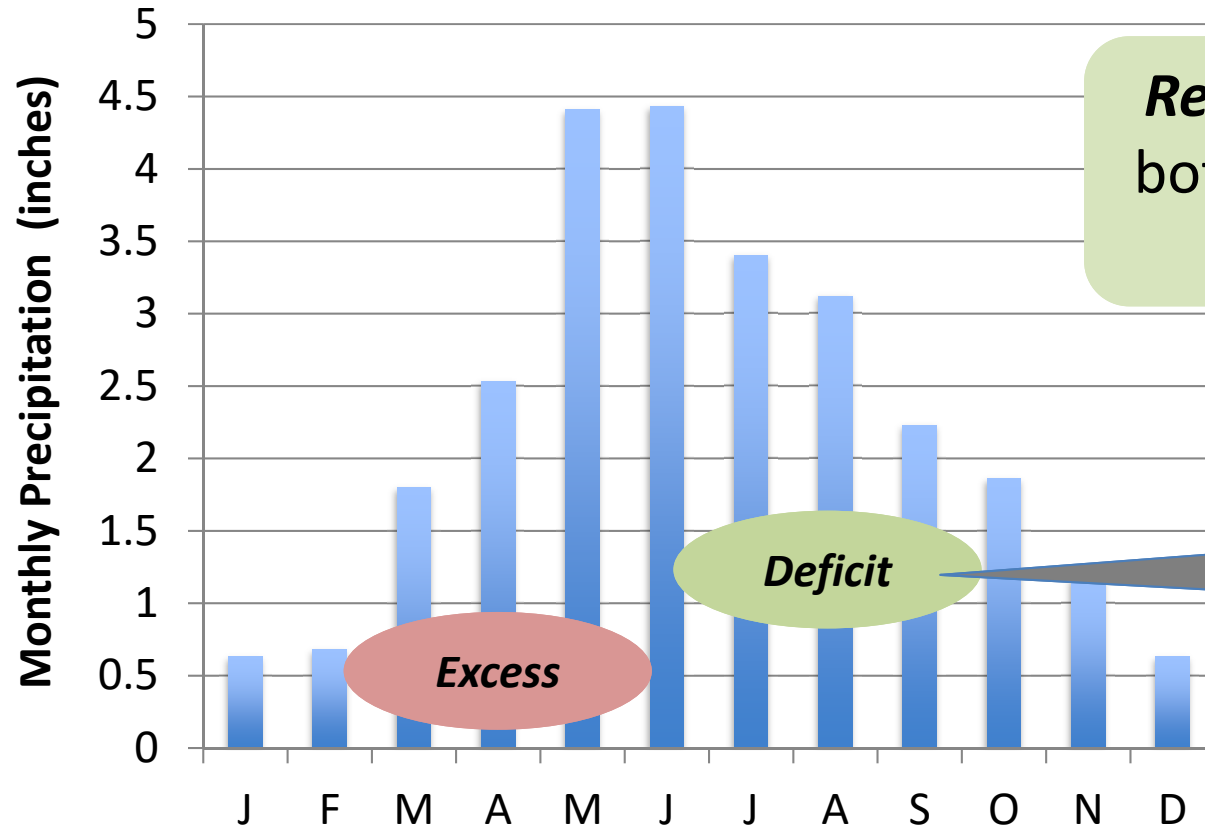


## *Platte River Aquifer*



Highly permeable soils  
Depth to water table (10 – 15 ft)  
High  $\text{NO}_3\text{-N}$  (10-30 mg/L)  
**Age of aquifer water (months – 20 yr)**

## Grand Island, Nebraska



***Reality*** : Water is both a CURSE and BLESSING

***Deficit***

Irrigation to the rescue

***Excess***

*Long-term Annual Precipitation - 26.9 inches*

*Evapotranspiration (irrigated corn) - ~29 inches.*

Annually & Seasonally Deficit



PREPLANT NITROGEN



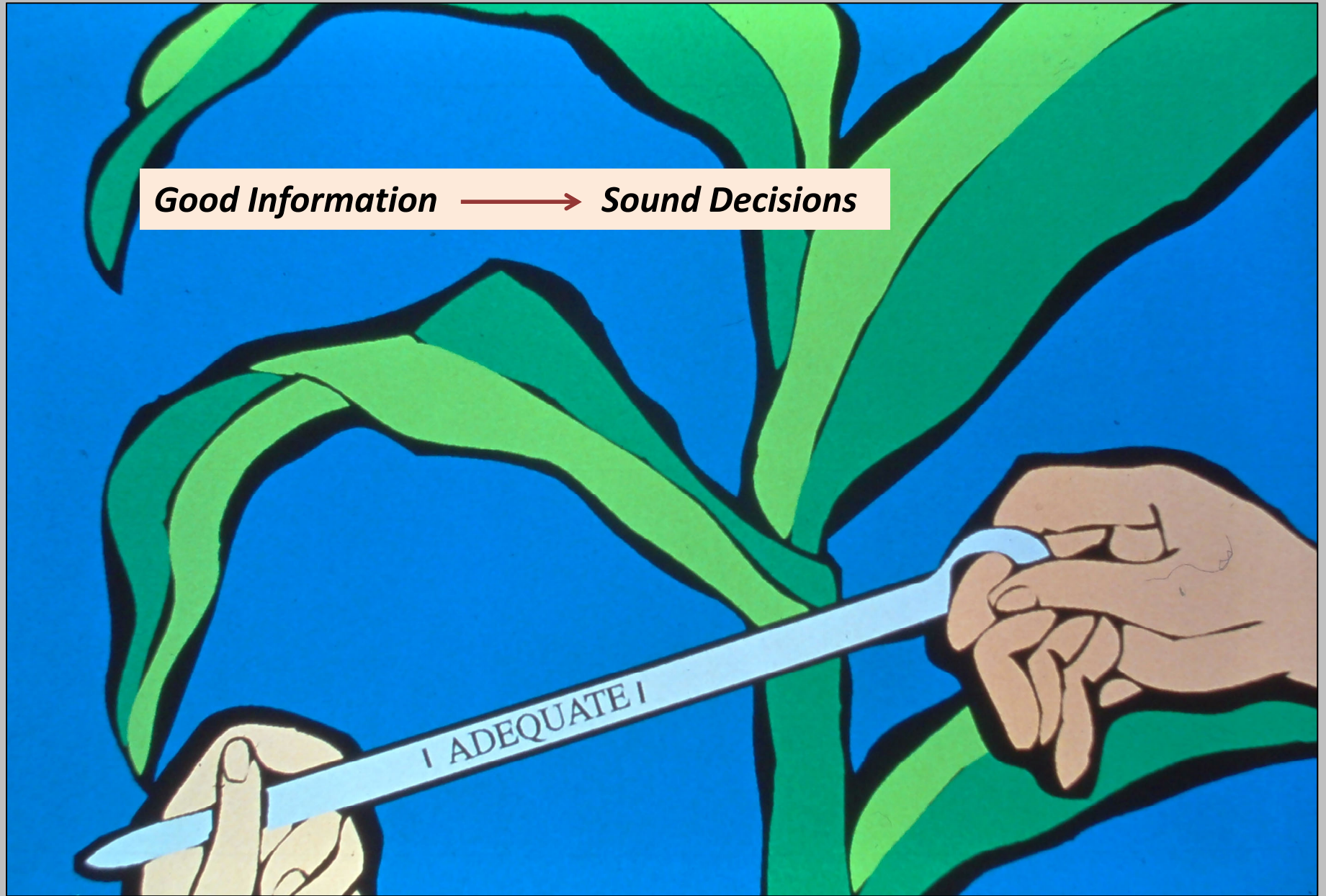
N-FERTIGATION

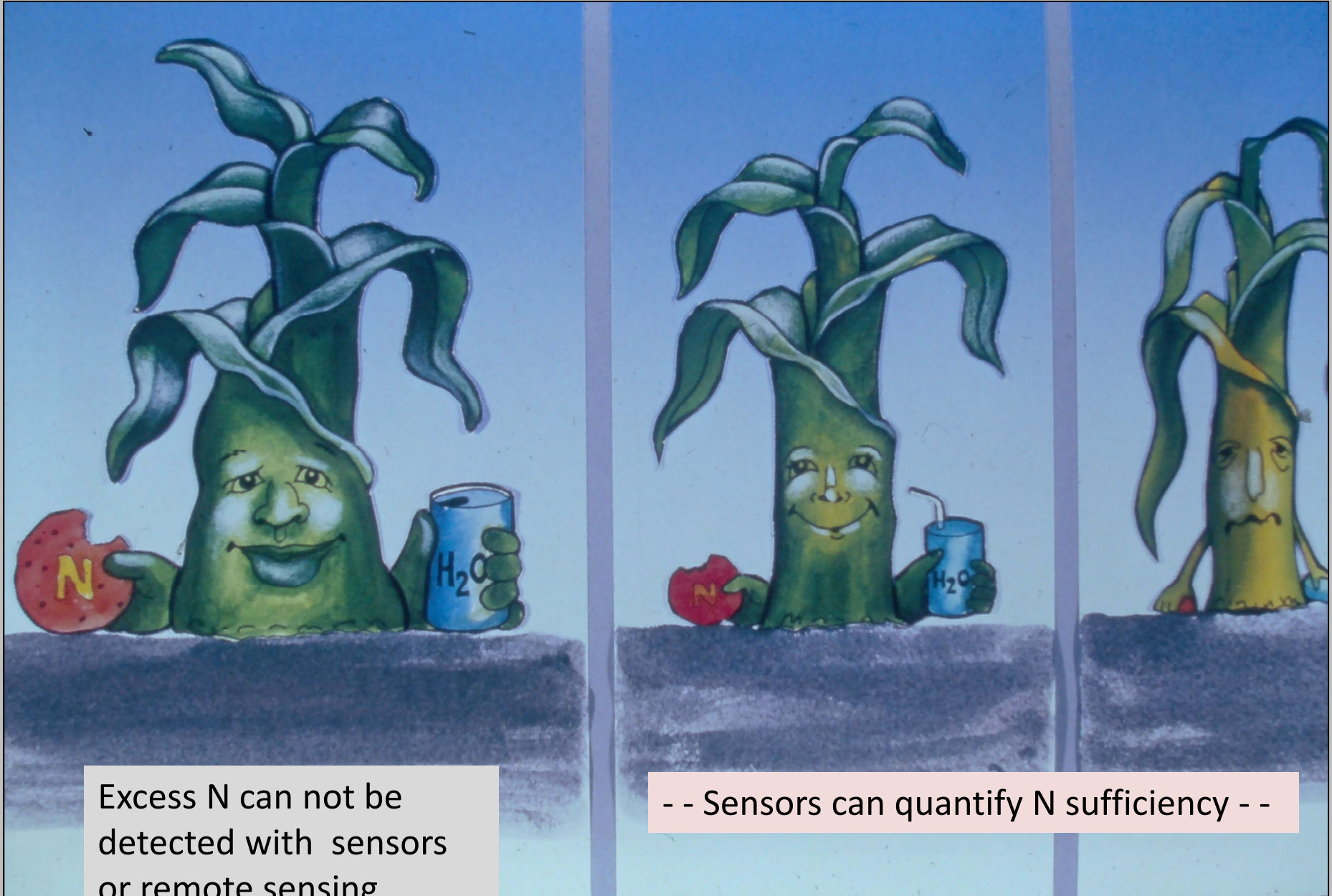


SPOONFEEDING N = LESS LOSS



*Good Information* —→ *Sound Decisions*





Excess N can not be detected with sensors or remote sensing

- - Sensors can quantify N sufficiency - -



# Extending Water / N Management Technologies

Where is the . . . .



Consultants  
tell me to . . .

Is there a . . . .

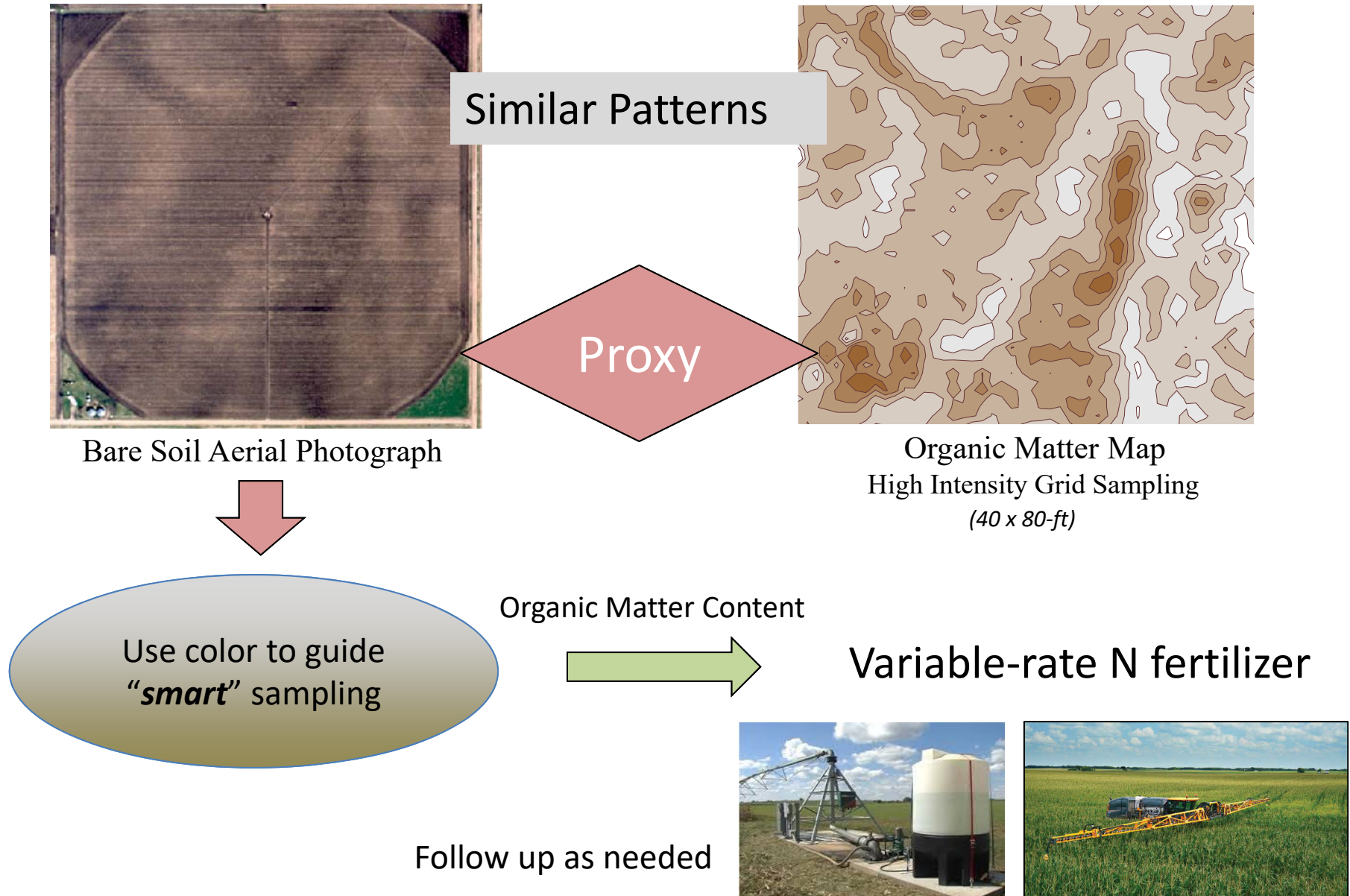


***“ Build on the Basics ”***



***“ Keep it Simple ”***

# Practical Approach #1 :





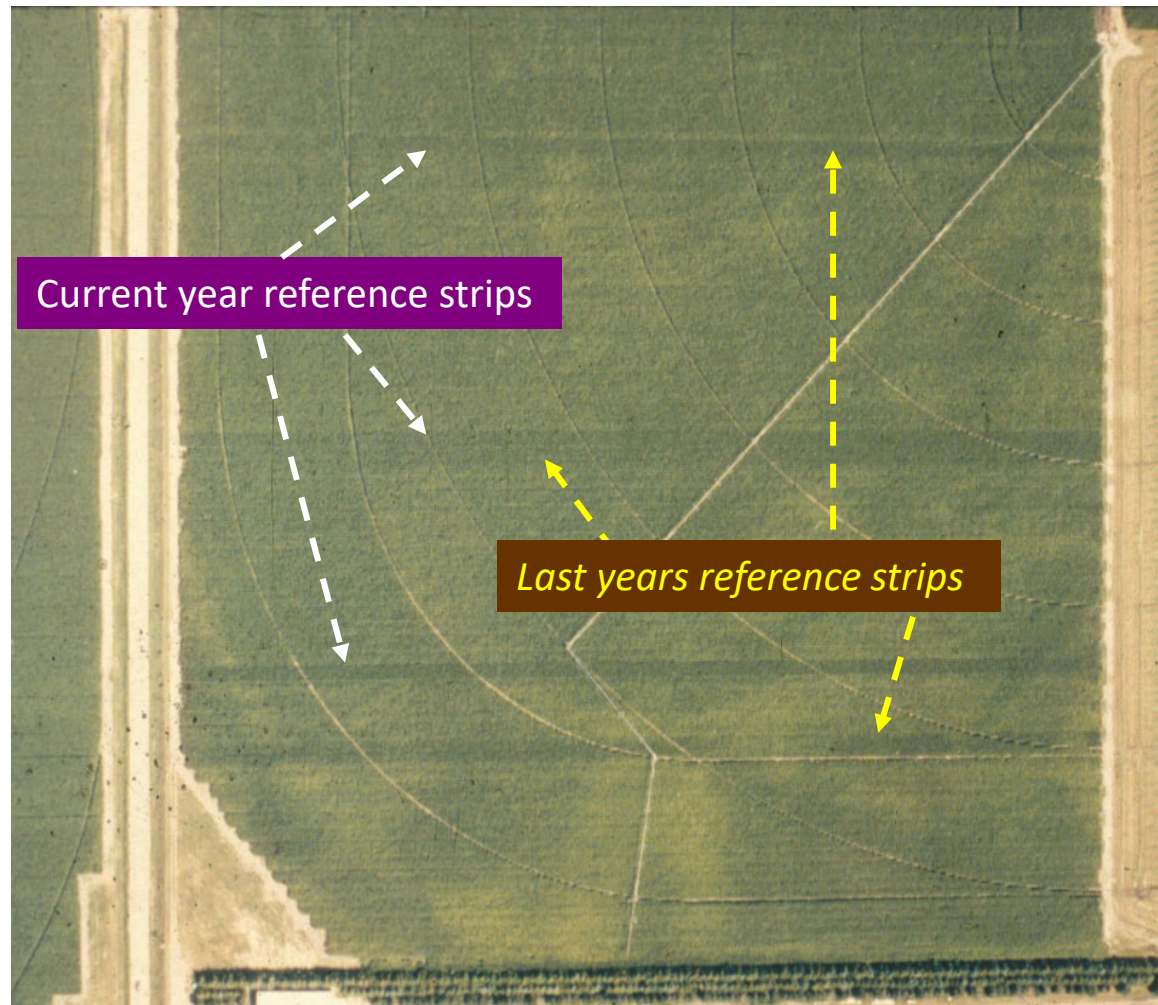
## Practical Approach #2 :

Reduced N Rate  
**with**  
N-Rich Reference

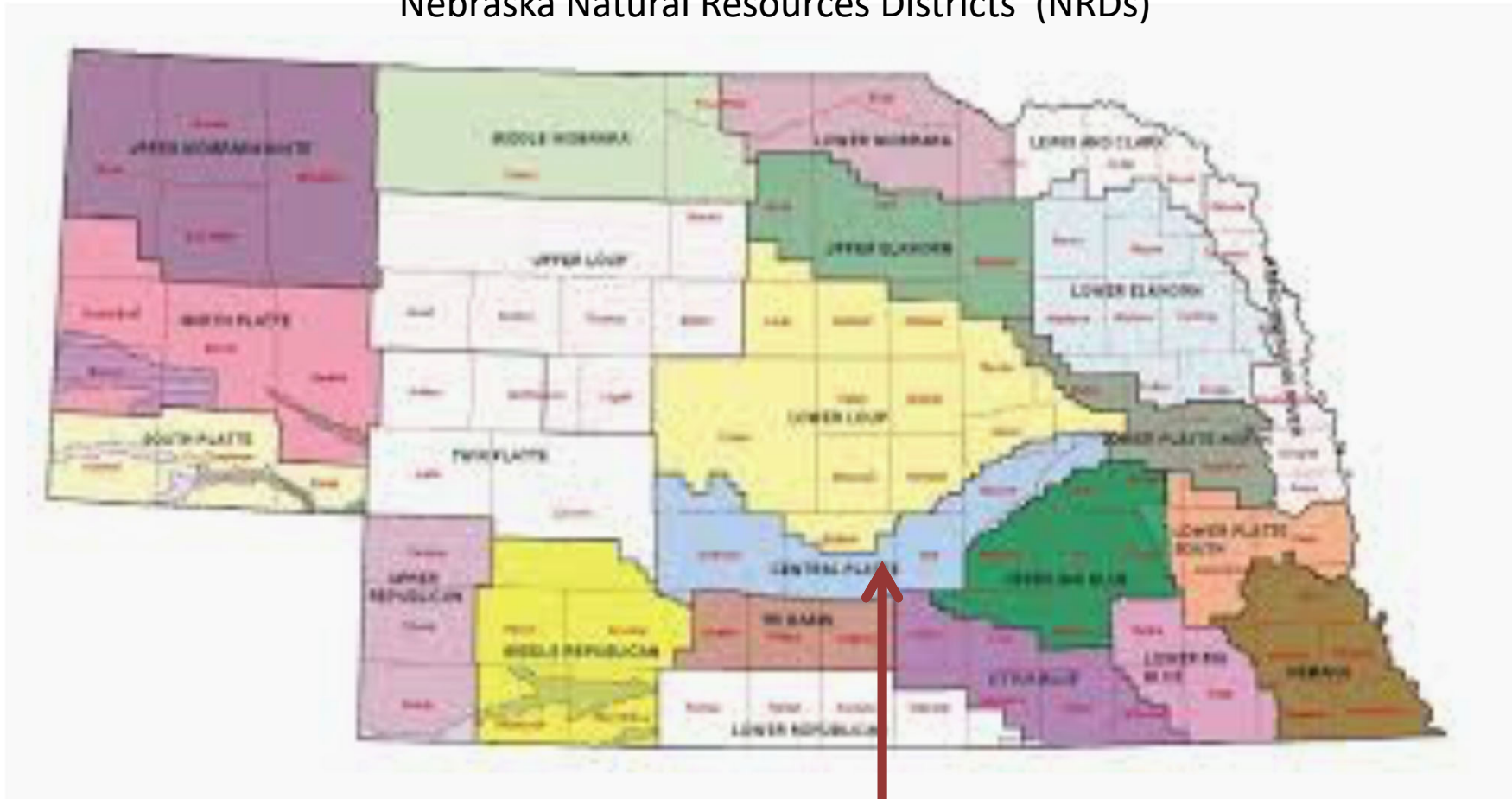
- Fertilizer
- Manure



N-Deficient Reference



## Nebraska Natural Resources Districts (NRDs)



**Taxing Authority** - up to ~\$3/acre

**Cost Sharing** - flow meters  
soil water sensors  
buried pipelines  
drip irrigation

**Imposed Restrictions** - No fall fertilizer  
Soil & water testing  
N recommendations  
N applied  
Irrigation amount  
Yield

**Require**  
Annual  
Report