

## Residue, ET, Water Savings

More residue → less evaporation, because less solar energy and lower wind speed (less air movement) at the soil surface

### Long term no-till:

- better soil structure, less soil crusting
- better infiltration, less runoff
- greater water holding capacity
- more snow trapping

## Water Savings with No-till

- Rogers Memorial Farm (Lincoln)
- Dryland, low rainfall years
- 3 bu soybean per inch of water



left: no-till, yield = 47.7 bu/ac  
right: plowed, yield = 23.2 bu/ac

Tillage System	2000			2006		
	Yield Bu/ac	Incr. Yield Bu/ac	Water Saved Inch	Yield Bu/ac	Incr. Yield Bu/ac	Water Saved Inch
Plow	23.2	0.0	0.00	43.2	0.0	0.00
D-Disk	36.1	12.9	4.30	56.2	13.0	4.33
No-till	47.7	24.5	8.17	62.0	18.8	6.27

## Irrigation Intensity, Frequency

Intensity affects runoff.  
Frequency affects evaporation.

Producer @ Ord (long term no-till): 2 inch every 8 days in a single round of pivot: no runoff

Tilled neighbors: 0.5 inch every 2 or 3 days: runoff, more evaporation (surface wetted more often)

117 bu/ac →  
Straw Spread



← 97 bu/ac  
Straw Not Spread  
and Baled

## Water Savings → Higher Yield

Up to 30% of ET is E during the irrigation season (corn, soybean, silt loam).

Water savings with wheat straw or no-till corn stover:

- 3 inch in growing season
- 2 inch in non-growing season

5 inch → 20 bu/ac soybean, 60 bu/ac corn

Based on research @ Garden City, KS

## Evaporation Reduced in Half

- flat wheat residue (6000 lb/ac)
- fully irrigated corn crop (9 irrigations each year)

Year	Growing season evaporation (inch)					
	No Crop Canopy			Crop Canopy		
	Bare	Straw	Diff.	Bare	Straw	Diff.
1986	15.1	8.5	6.6	7.6	3.8	3.8
1987	14.6	9.4	5.2	8.5	5.7	2.8

Based on research at North Platte

6000 lb/ac →  
Wheat Residue



← No Residue

## Current/Future Research

UNL, North Platte: effect of residue on evaporation. Soil water content measured under soil covered with soybean residue and under bare soil.

Similar study at Curtis. Extend to larger fields (cooperators, fields near Brule)



Residue study at North Platte