Residue, ET, Water Savings

More residue \( \rightarrow \) 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

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<tr>
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<td>Yield</td>
<td>Incr. Water Saved</td>
<td>Yield</td>
<td>Incr. Water Saved</td>
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<td>0.00</td>
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<td>D-Disk</td>
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<td>12.9</td>
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<td>No-till</td>
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<td>24.5</td>
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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)
**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

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**Evaporation Reduced in Half**

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

<table>
<thead>
<tr>
<th>Year</th>
<th>Growing season evaporation (inch)</th>
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<tr>
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<td>1987</td>
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</tbody>
</table>

Based on research at North Platte

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6000 lb/ac → Wheat Residue

No Residue

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**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