

Predicted Infiltration Rates for Cropland

“Second Inch rates”

(Min. 1 hour time delay between application of 1st and 2nd Inch)

The prediction of infiltration rate for cropland is determined by the plant community (i.e. rotational diversity/cover crop) and the type of tillage system being employed. Both of which are rated on a five-tier scale in a factorial arrangement such that the value for the interaction is the product of the multiplication.

Rotational System

The values for the various rotational systems are listed as follows:

1– Diverse cropping system that includes all four crop types. Perennials as well as cover crops are part of the system. Contains at least two thirds high residue crops – manure or grazing is part of the management system.

2 – Cropping system that includes all four crop types incorporated into the crop sequence. Contains at least two thirds high residue crops.

3 – Cropping system that includes at least 3 crop types in the cropping sequence. Contains 50-60% high residue crops with cover crops are part of the rotational system.

4 – Cropping system includes 2 crop types with 50% high residue crops or high residue mono-cropping systems.

5 – Mono-cropping system with a low residue crop

Tillage System:

The values for the various rotational systems are listed as follows:

1) **No-till/strip-till** - The soil is left undisturbed from harvest to planting except for strips up to 1/3 of the row width (strips may involve only residue disturbance or may include soil disturbance).

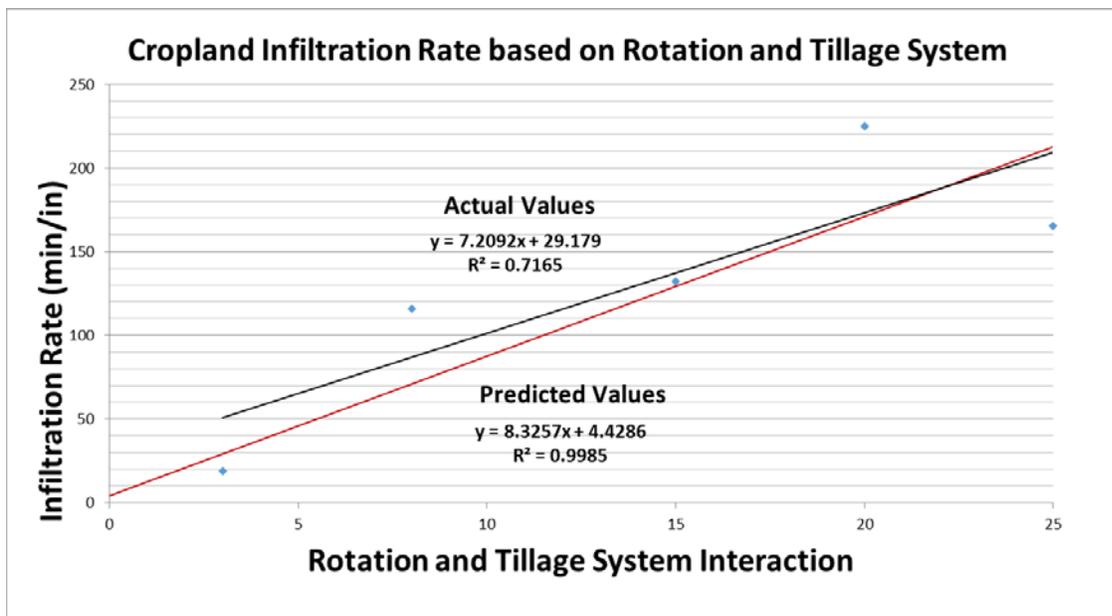
2) **Ridge-till** - The soil is left undisturbed from harvest to planting except for strips up to 1/3 of the row width. Planting is completed on the ridge and usually involves the removal of the top of the ridge. Planting is completed with sweeps, disk openers, coulters, or row cleaners. Residue is left on the surface between ridges.

3) **Mulch-till** – Full-width tillage that involves one or more tillage trips, disturbs the entire soil surface and is done prior to and/or during planting. Tillage tools such as chisels, field cultivators, disks, sweeps or blades are used.

4) **Reduced-till** (15-30% residue) - Full-width tillage that involves one or more tillage trips, disturbs the entire soil surface and is performed prior to and/or during planting.

There is 15-30 percent residue cover after planting or 500 to 1,000 pounds per acre of small grain residue equivalent throughout the critical wind erosion period.

5) **Conventional-till or intensive-till** - Full-width tillage that involves one or more tillage trips and disturbs the entire soil surface and is performed prior to and/or during planting. There is less than 15 percent residue cover after planting, or less than 500 pounds per acre of small grain residue equivalent throughout the critical wind erosion period. Generally involves plowing or intensive (numerous) tillage trips.



Listed below are examples of cropland systems and their corresponding infiltration rates, All rates are listed in elapsed time (min./inch). That is the time necessary to move one inch of water into the soil. Times are all listed as 2nd inch infiltration values.

- 1) **Highly diverse rotational system** with a minimum of all four crop types in a long term **No-till** system utilizing cover crops and manure management/livestock integration.
Elapse time range 2-10 min.
- 2) **Diverse rotation with 3 crop types** in a long term **No-till** system. Elapse time range 15-25 min.
- 3) **Corn/Soybean rotation** in a long term **No-till** system.
Elapse time range 35-40 min.
- 4) **Corn/Soybean rotation** in a **Min-till** system > 30% surface residue. Elapse time range 50-60 min.
- 5) **Continuous corn** in a **Reduced-till** system < 30% surface residue. Elapse time range 120-140 min.
- 6) **Corn/Soybean rotation** in a **Conventional tillage** system <5% surface residue.
Elapse time range 160-180 min.