SOIL AND CROP TOLERANCE

"T" Value Objectives

Participants will understand:

- Soil Loss Tolerance
- Crop Tolerance and Evaluating Erosion Rates for Management periods

Soil Loss Tolerance

The average annual soil erosion rate that can occur with little or no long term degradation of the soil resource on the field thus permitting crop productivity to be sustained economically for an indefinite period of time.

Crop Tolerance

Wind and/or blowing soil can have an adverse effect on growing crops. Crop tolerance can be defined as the maximum erosion that a growing crop can tolerate, from crop emergence to field stabilization, without an economic loss to crop stand, crop yield, or crop quality.

Blowing Soil Effects on Crops

Some of the adverse effects of soil erosion and blowing soil on crops include:

- Blow outs that remove planted seeds, tubers, or seedlings.
- Exposure of plant root systems.
- Sand blasting and plant abrasion resulting in:
  * Crop injury
  * Crop mortality
  * Lower crop yields
  * Lower crop quality
- Wind damage to seedlings, vegetables, and orchard crops.

Crops vary in their ability to tolerate blowing soil or wind. Many common crops have been classified based on their tolerance to blowing soil. These categories and typical crops in that category include:

- Tolerant ("T") - barley, buckwheat, flax, millet, wheat, rye, oats, grain sorghum
- Moderate Tolerance (2 ton/Ac) - corn, soybeans, sunflowers, sweet corn, cucumbers
- Low Tolerance (1 ton/acre) - alfalfa, broccoli, cabbage, cotton, lima beans, onions (>15 days after emergence), orchard crops, peas, potatoes, snap beans, sweet potatoes, tomatoes

- Very Low Tolerance (0.0 - 0.5 tons/ac) - asparagus, carrots, celery, eggplant, lettuce, muskmelons, onions (<15 days after emergence), peppers, spinach, squash, strawberries, sugar beets, table beets, watermelons,

Evaluating Erosion rates

The conservationist needs to be aware of specific crop's tolerance to blowing soil. Soil erosion rates, determined using the Management Period Method, during critical crop development and growth periods can be evaluated to identify time periods when additional measures to protect the crop may be needed.

After a management period analysis has been completed, one can quickly tell during which management periods soil erosion rates exceed crop tolerance as well as if the average annual erosion rate exceeds soil resource tolerance levels.

Summary of Soil and Crop Tolerance

- Soil loss tolerance is assigned for each soil map unit.
- Crop tolerances to blowing soil are usually less than soil loss "T."
- Crops vary in their tolerance to blowing soil and wind.
- A management period analysis can be used to identify periods when predicted soil erosion rates may cause crop damage.