Soil erosion lessens food, fiber production

HARRISBURG — Many acres of cropland aren't producing food and fiber at top capability, a USDA Soil Conservation Service, spokesman said. "This is because modern conservation farming methods aren't being used enough and erosion is still occuring at an alarming rate."

State Conservationist Graham T. Munkittrick said, "Most of the erosion we have in Pennsylvania comes from 5.7 million acres of cropland. Water causes this erosion by moving soil from where it was formed. This lost soil is generally the most productive topsoil."

But, is erosion more serious now than it was in the late 1940s?

The answer is yes and no. Erosion is separated into two parts, gully erosion and sheet and rill erosion. Gully erosion is defined as channels cut in the soil too deep to be smoothed out by ordinary cultivation. Sheet erosion is when continuous layers of soil are removed by the combined actions of beating rain and flowering water. Rill erosion is the result of wearing very small channels in the soil as water moves down a slope.

"Gully erosion control has improved considerably, but sheet and rill erosion are estimated to be 25 to 50 percent worse on farms because of increased intensity of cropping," Munkittrick said. "On farms where no conservation measures are being used, the erosion is estimated to be 400 percent worse."

Man speeds up the erosion process through many agricultural and construction activities that break up the soil surface and remove protective vegetation. This makes topsoil very susceptible to water erosion. Planting and growing crops necessitates some disturbance of the soil. In recent years, questions have been asked about how much plowing, disking and cultivating is necessary to produce a good crop.

To answer the question, economic losses caused by erosion, machinery use, problems of weeds and insects, and the management of water should be considered. These all relate to solving erosion problems

"During the last 30 years the economic developments in agriculture have prompted many farmers to quit growing hay as a part of a crop rotation plan," said John Spitzer, SCS agronomist. "The shift has been to continuous row crops (corn and soybeans) year after year. This practice can lead to severe erosion

"The available modern methods of controlling erosion just aren't being used as much as they should be. In fact, some terracing and stripcropping are being removed," Spitzer said. "The increase in erosion and resulting soil loss are needless and wasteful since they can be controlled by more modern methods."

Soil losses are measured in tons per acre per year. SCS has determined the average loss each soil can tolerate and not reduce its productive capacity. Some soil can lose only 1 ton per acre each year, while other soils can lose as much as 5 tons without damage.

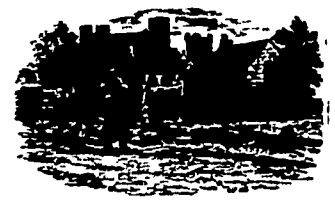
In 1977, the average loss rate was about 5 tons per acre nationwide. In Pennsylvania, it was 5.5 tons per acre. Cropland in southeastern Pennsylvania has an average soil loss of 9 tons per acre annually. In some areas the loss was 40 tons or more. The consequences of this level of erosion are lost food and fiber production, loss of valuable soil nutrients, and poor water quality in lakes and streams.

The most practical method developed to date for bringing erosion down to acceptable levels is to leave crop residues on the soil surface as a protective cover through the entire year.

"The residue provides varying amounts of protection depending upon the kind left on the soil surface," Spitzer said.

Tests show conservation tillage methods can reduce erosion by 50 to 90 percent when leaving 3,000 to 6,000 pounds of cornstalk on the soil surface under some conditions. When slopes exceed 8 percent and 250 feet in length, conservation tillage is not effective and needs to be supported by terraces and other practices to control erosion.

"Going one step further," Spitzer said, "with the addition of contouring and terraces, soil erosion can be reduced by 97 percent compared to the soil erosion that would occur under conventional tillage (plowing or disking). These figures show that by combining mechanical and vegetative practices and conservation tillage, erosion problems can be conquered," he continued.



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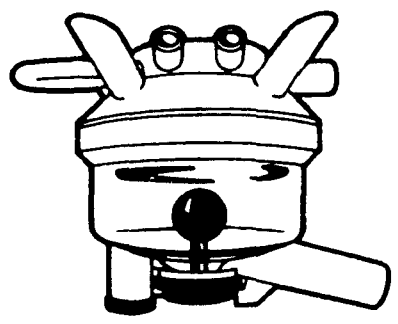

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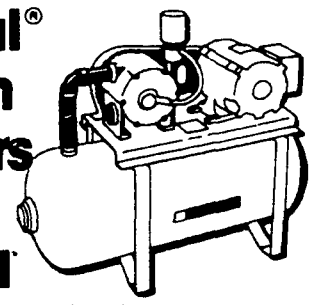

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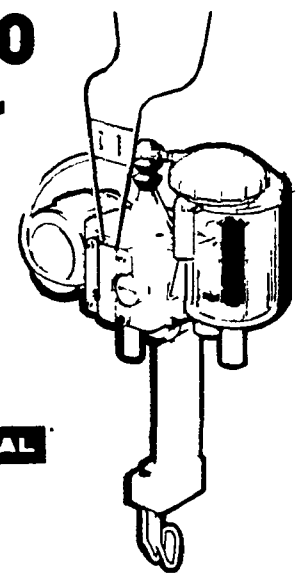

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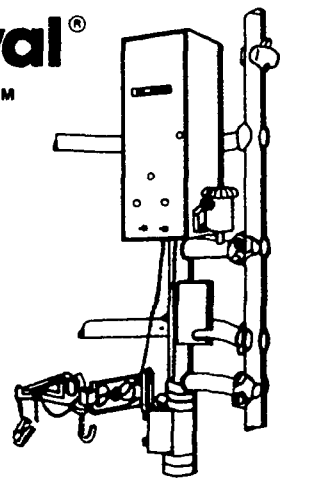

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