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Doubled Wheat Yields

Of the world's estimated 3¼ billion acres of land that are used for cultivated crops, only approximately 11 percent are currently irrigated.

Most developed countries are already diverting as much water for agricultural use as possible. Developing countries either lack capital or know-how for such vast undertakings.

For these reasons, SEA is looking for methods to utilize every available drop of precipitation that falls or is already in soils.

At the U.S. Central Great Plains Research Station, Akron, Colo., SEA scientists have analyzed data from 1916 to the present. These records show that proper soil management can more than double wheat yields on dry lands.

From 1916 to 1930, precipitation at Akron averaged 17.3 inches per year and wheat yields averaged 15.0 bushels per acre. In the 1970's, improved management practices more than doubled wheat yields to 32.2 bushels per acre—and that's during a period that averaged 15.3 inches annual precipitation.

"Part of this yield increase is undoubtedly due to new and improved wheat varieties. However, the greatest increase is attributed to improved soil management practices that have increased soil-water storage during fallow," say SEA soil scientists Darryl E. Smika and Bentley W. Greb.

Fallow is the period during which agricultural land is left unseeded. During this time, soil moisture is stored from the precipitation received. This stored moisture is then available for the next crop.

The two practices during fallow that are necessary for increasing soil moisture storage are weed control and the maintenance of mulch on the soil surface.

"Our research shows that the best way to maximize wheat production on these areas is by controlling *all* weed growth during the entire fallow period. Even a few weeds per square yard remove water that the subsequent crop must have.

"Also, maintaining stubble from the previous crop in a standing position during the over-winter portion of fallow provides an excellent means of trapping and holding snow. Then during spring thaw, the snow melts into the soil and agricultural lands, not into ditches or fence lines," says Greb.

Soil moisture gained from snow melt amounts to approximately 40 percent of that stored in soil during fallow.

Maintaining a surface mulch on the soil aids in moisture retention both by decreasing soil temperature and by diverting drying winds to a level above the soil surface.

Dr. Darryl E. Smika and Mr. Bentley W. Greb are with the Central Great Plains Research Station, P.O. Box K, Akron, CO 80720.—D.H.S.