

Have you ever wondered if sunflower root deeper and use water from deeper in the soil profile than grain sorghum, or is that just an old farmer's tale?

Results from a three-year study at the Southwest KS Research-Extension Center near Tribune provide answers to that question. The study site was a Ulysses silt loam soil. Soil water content was determined every two weeks during the growing seasons using a neutron probe and seasonal water depletion was calculated by subtracting the final soil water content at crop physiological maturity in September from the initial water content in early June. Rooting depth was determined by taking a soil core sample centered over a plant and identifying the depth at which roots were no longer visible.

The rooting depth for sunflower was greater than for grain sorghum and sunflower used water from deeper in the profile. Sunflower rooted to about 3.3 yards deep, while grain sorghum rooted to about 2.8 yards deep. Water depletion was about 1.3 inches greater for sunflower (1.9 inches) than sorghum (0.6 inches) from the 2.4 yards to 3.6 yards depth. In the upper 2.4 yards of the soil profile, water depletion was similar for both crops.

What's the bottom line?

Because sunflower root deeper and deplete water deeper in the soil profile it is an excellent crop in a rotation to utilize water and nutrients, such as nitrate, that have moved deeper in the profile. Also, rotating irrigated and dryland crops provides increased subsoil water for the dryland crop (sunflower) to utilize that would otherwise be lost. The 1.9 inches of water that sunflower depleted from below the 2.4-yard depth converted to about 300 to 400 pounds per acre of seed yield.

For details about this research see:

Agronomy Journal 94:936-943. 2002. Water depletion depth of grain sorghum and sunflower in the Central High Plains.

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