

Subsoil Moisture Levels for 2003

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Introduction

Each spring and fall a soil moisture survey is conducted to determine the amount of plant-available water (PAW) in the top five feet of the major soils in Iowa. Adequate soil moisture reserves increase the probability of average or above average crop yields the following season. Producers may use this information to alter their crop management plans according to expected soil moisture levels. Several sampling sites are located at the Western Research and Demonstration Farm.

Results and Discussion

Results from the spring sampling indicate that west central Iowa went into the planting season in very good shape with a greater than average amount of moisture stored in the area's subsoil.

The fall 2002 sampling indicated very good soil moisture profiles across the region and despite last winter's lack of moisture, most areas picked up some additional moisture for the season's crop. When compared with the average spring moisture levels (1999–2003), the spring 2003 subsoil moisture condition was about 115% of the 5-year average, with a range of 94 to 138%. Interestingly, the Castana location with 138% of the spring average is still one of the driest sample sites in west central Iowa. On the average across sampling locations, 8.6 inches of plant available water (PAW) is stored in the 60-inch root zone. This was the best spring subsoil moisture condition the area has been in since 1999 when an average 10.1 inches of PAW was stored in the 60-inch root zone.

Carroll, Calhoun, Sac, Ida, and Pocahontas counties had very good soil moisture profiles,

averaging 10.25 inches of plant available water in the top 60-inches, 1.75 inches more than the previous spring, and 0.65 inches more than the previous fall. On the other hand, Monona and Crawford counties (although improved from the previous fall) needed substantial spring rains to replenish the soil moisture profile. These two counties had an average of 6.4 inches (PAW), which is 55% of the soil's holding capacity. The soil profile in the driest counties needed to be recharged in the 36–60 inch depth level.

Fall Soil Moisture Status. Results from the fall sampling indicate that west central and northwest Iowa went into the winter season with a very dry soil profile. The average plant available water in the 7-county area was 2.6 inches of a potential 11 inches, or 24% of the soil's capacity. The region's soil moisture level was 56% of the 5-year fall average, which was very low when compared with last fall's 180% of the 5-year fall average. The soil moisture sampling occurred the last week of October; so rainfall the area received in early November is not represented in these data.

Southern Sac and Carroll counties were the only areas showing decent fall soil moisture levels with moistures ranging from 3.9–6.4 inches of plant available water. All other sampling areas had plant available water at levels less than 3.2 inches (29% of capacity) with a low of 0.5 inches near Castana in Monona County. Significantly above normal precipitation during the fall and spring would be required to bring soil moisture levels up to levels we would like to see in the spring. Figuring about 75% efficiency in capturing and storing precipitation in the soil, the area will need about 10 inches of rain before planting to bring the soil to capacity.

Table 1. Spring and fall 2003 subsoil moisture.

County	Spring PAW* inches	% of Capacity	Fall PAW* inches	% of Capacity
Crawford	7.3	62	2.0	18
Monona	5.6	48	0.9	8
Ida	9.2	76	2.3	19
Woodbury	8.9	-	4.0	-
Carroll	12.1	97	3.9	31
Sac	9.4	82	3.7	34
Pocahontas	11.4	100	3.2	29
Calhoun	8.9	80	1.9	17

*PAW = Plant Available Water

Spring sampling date = April 10, 2003; Fall sampling date = October 27, 2003

Sampling depth = 60 inches