

2013

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Recommended Citation

DeJong, Joel L.; DeJong, Joel L.; and Kassel, Paul C., "Soil Moisture" (2013). *Iowa State Research Farm Progress Reports*. Paper 2087.
http://lib.dr.iastate.edu/farms_reports/2087

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Soil Moisture

RFR-A1367

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Introduction

Soil moisture is critical for crop production in most years in northwest and west central Iowa.

Materials and Methods

Soil moisture samples were taken at 15 sites in northwest and west central Iowa during the last few days of October 2013. Sites near Spirit Lake, Rossie, and Schaller were taken on November 20, 2013. Moisture samples were taken at 1-ft increments down to a 5-ft depth. Samples were weighed, oven dried, and reweighed at the Northwest Research Farm. The moisture percentage was calculated from these data, and then used to calculate the inches of plant-available moisture in the soil. The data from these sites are listed in Table 1.

Results and Discussion

The amount of subsoil moisture in northwest/west central Iowa shows several sites that have improved over the last few years. The level of subsoil moisture at the soil moisture sites for 12 northwest Iowa counties ranged from 1.8 in. to 7.9 in. of plant-available moisture. The average among the 15 observations in the 12 counties was 5.3 in., compared with the 4.5-in. average from the sites sampled in 2012. The median value was

5.8 in. of plant-available moisture, which compares with the median value of 2.9 in 2012. There was less than 5 in. of plant-available moisture in the top 5 ft of soil in 40 percent of the 2013 observations. In 2012, 85 percent of the sampled sites had less than 5 in. of measurable plant-available water. Sites near Sibley, Spirit Lake, Sanborn, Akron, Schaller, and Castana had plant-available soil moisture levels below the long-term fall averages for their counties. Only the Sanborn, Cherokee, and Schaller sites had less available water than measured on November 1, 2012.

Soil moisture has been a concern since July of 2011. Rainfall has been below normal to much-below normal since mid-July 2011. Subsoil moisture levels were below normal at most of the locations when subsoil moisture levels were checked during the fall of 2011 and in late April 2012. Some areas remain below normal in this region, but others have shown significant recovery when compared with the previous three years.

Rainfall during November, March, and April also will contribute to subsoil moisture. Typical rainfall for those months is 4.8 to 5.7 in. About 80 percent of that rainfall contributes to subsoil moisture reserves. The early growing season of 2013 demonstrated how quickly soil moisture concerns can change.

Table 1. Soil moisture available to plants.

Site	County fall average (in.)	County	2013 crop	Plant-available moisture (in.)
Doon	4.3	Lyon	soybean	5.8
Sibley	5.1	Osceola	corn	2.5
Spirit Lake	5.7	Dickinson	soybean	4.5
Ireton	4.2	Sioux	corn	7.2
Sanborn	5.9	O'Brien	soybean	4.1
Sutherland	5.9	O'Brien	soybean	7.2
Rossie	5.7	Clay	soybean	7.9
Akron	4.3	Plymouth	corn	2.9
Le Mars	4.3	Plymouth	soybean	6.9
Cherokee	5.6	Cherokee	soybean	5.8
Marcus	5.6	Cherokee	soybean	6.7
Lawton	4.6	Woodbury	soybean	6.5
Battle Creek	6.0	Ida	corn	6.6
Schaller	5.9	Sac	soybean	2.5
Castana	4.9	Monona	soybean	1.8