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## Subsoil Moisture Levels are Still a Concern for 2012 Crops

**Paul Kassel, Extension Field Agronomist**

The Iowa State University spring survey of subsoil moisture in northwest Iowa indicates below normal amounts of subsoil moisture in most areas. The exception was near Rossie where the subsoil moisture was 1.3 inches above normal. Subsoil moisture levels are surveyed in pre-determined areas each spring and fall.

Typical soils in northwest Iowa have the potential to hold from 10.0 to 11.0 inches of moisture in the top five feet of soil. The dry conditions last summer and fall left the soil moisture reserve very low. Soil moisture readings from sites near Spirit Lake, Rossie and Pocahontas had 1.4 to 5.0 inches of plant available moisture last fall.

These sites gained an average of 4.0 inches of subsoil moisture over the winter and spring months. This moisture recharge has occurred from winter rainfall and early spring rainfall. The winter rainfall contributed to subsoil moisture because mild winter conditions left soils unfrozen during much of the winter.

Sites near Schaller, Pocahontas and Spirit Lake have below normal levels of subsoil moisture. Soil moisture levels at these sites range from 5.7 to 7.2 inches of plant available moisture. Moisture amounts at these sites are located in the top three feet.

The subsoil moisture at the Schaller location illustrates this point. There is 4.0 inches of moisture in the top two foot of soil, 1.3 inches of moisture in the third foot and virtually no moisture in the fourth and fifth foot of the soil profile. The location of this moisture in the soil profile will make these soils very dependent on spring and early summer rainfall to produce a normal crop.

However, if spring rainfall does not replenish soil moisture reserves in late April or May, crops will be more dependent on summer rainfall. Corn and soybean crops require about 22 inches of soil moisture to produce a normal crop. Therefore, normal summer rainfall – which is about 18 inches for May to mid September – will be needed to produce a normal sized corn and soybean crop. Rainfall usually contributes about 80 percent to soil moisture levels.

### Table 1. Subsoil moisture levels, 2012.

Location (County)	2011 crop	Fall 11/1/11	Spring	
			County Average	Spring 4/23/12
-----inches plant available moisture-----				
Spirit Lake (Dickinson)	Soybean	1.4	7.8	5.7 (5.2)
Rossie (Clay)	Soybean	5.0	7.5	8.8 (7.8)
Rolfe (Pocahontas)	Corn	3.3	7.6	7.2 (7.0)
Schaller (Sac)	Soybean	-	7.7	6.2 (5.3)

The spring 2012 information was adjusted to include 80 percent of the rainfall that occurred from April 19 to April 21, 2012. Numbers in parentheses are the actual subsoil moisture levels on the sampling date.

**Table 2. Rainfall amounts since sampling date.**

Location	Sample date	Rainfall since	Moisture gain
		sample date	since fall
-----inches-----			
Spirit Lake	4/18	0.6	4.3
Rossie	4/18	1.2	3.8
Rolfe	4/20	0.3	3.9
Schaller	4/17	1.1	-

**Table 3. Rainfall amounts since fall subsoil moisture sampling.**

Location	11/1/11 to	3/16/12 to
	3/15/12	4/21/12
-----inches of rainfall-----		
Estherville	3.5	3.7
Sioux Rapids	4.0	3.5
Pocahontas	3.6	3.3
Sac City	3.6	3.1

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