

**SECTION 686.151**

Example Problem on the Use of Electrical Resistance Blocks.

Example of developing a graph for estimating when and how much water to apply.

(1) Given

- (a) Resistivity block in the second quarter of a 4-foot root zone.
- (b) The following data was collected:

Soil Texture	Depth (inches)	AWC in/ft
Loam	0-24	2.0
Vfsl	24-48	0.95

Total AWC = 5.90 inches

Resistivity readings (ohms)	SWC for 4-foot profile (inches)
13,500	2.36
6,000	2.94
3,200	3.54
1,850	4.12
1,100	4.72

(2) Find

- (a) Develop a graph to estimate the soil water content (SWC) for the 4-foot profile.
- (b) Show how to use the graph to estimate when and how much to apply.

(3) Solution

- (a) On graph paper (Logarithmic 2x3 cycle) plot SWC versus resistivity readings and connect the points. If necessary, extend the line to cover a range from field capacity to the MAD level set for the crop being irrigated. Indicate the MAD point on the graph. Figure 686-10 was developed for the given data. As an alternative, the soil water deficiency (SWD) can be plotted and the amount that needs to be applied can be read directly from the graph.
- (b) To use the graph, enter a given resistivity reading and move vertically upward and intersect the curve; go left and read SWC for the soil profile.

## NEBRASKA AMENDMENT

Example:

Resistivity reading = 2200 ohms  
SWC = 3.9 inches

To determine how much water is needed to fill the profile, subtract SWC from AWC.

$$\begin{aligned} F_n &= AWC - SWC \\ &= 5.90 - 3.90 \\ &= 2.0 \end{aligned}$$

In this example, the SWC has not reached the MAD point which is about 2.95 inches. The irrigator can wait several days before he needs to irrigate.

**TABLE 686-4**

**ELECTRICAL RESISTANCE READINGS FOR STARTING  
IRRIGATION OF CORN AND GRAIN SORGHUM**

Meter readings on shallow block			
Soil Texture	Meter Reading		Electrical Resistance (Ohms)
	Old Scale	New Scale	
Loamy sands Sandy loams	120	6.0	3200
Very fine sandy loams Silt loam	100	5.0	4800
Clay loams Silty clay loams	80	4.0	7000