Measuring Well Water Levels
Marvin N. Shearer, Extension Irrigation Specialist, Oregon State University

The water level in many wells is likely to drop drastically due to excessive well development in certain areas or extended drought. Keeping a record of what is happening in your well will give prior warning of its running dry.

Three methods for measuring water level are described. Measurements should be made at least every two to four weeks. Make a permanent record of depth to water surface so any trend of a change in water level can be readily detected.

**Electric sounder** or **electrical depth gauge** is perhaps the handiest method for measuring well water levels. It uses a weight suspended on #16 or #18 stranded insulated wire and a voltmeter to indicate a closed circuit current flow when the end of the wire touches the water surface. Current is supplied by a small 9- or 12-volt battery. To make a reading, lower the electric wire or sounding line until needle deflects. Read distance on line from water to top of casing. Use reference marks on or attached to the upper end of the electric cable at about one-foot intervals to simplify measuring. Because of the low electrical conductivity of most ground water, a meter should be used in the circuit rather than a light bulb. Electrical sounders, including a reel of wire, meter, and battery are available commercially. If well casing is plastic, the ground wire from the battery must be extended and submerged into the water.

**Wetted tape** method is very accurate for measuring water levels to depths up to about 90 feet. The approximate depth (A) to water must be known for this method to work satisfactorily. Attach a lead weight to the end of a 100-foot steel measuring tape. Dry 8 to 10 feet of tape end and coat with carpenter's chalk or keel (ocher dust) before each measurement. Lower tape down well until a part of chalked section is below water. At this point, check a foot mark on tape exactly at top of casing or some other measuring point. Pull tape up, read wetted line mark, and determine actual depth from top of casing to water level.

**Air line** method consists of a small diameter pipe or tube long enough to extend from top of well to a point about 20 feet below lowest anticipated water level. Measure exact length of air line as it is placed in well. Make sure air line is air tight and hung vertically, taking care that it does not spiral inside well casing. Quarter-inch copper or brass tubing is commonly used. Fit upper end with a tee and pressure gauge plus a valve to which a hand air pump is attached. The gauge may be calibrated to indicate pressure directly in feet of water or pounds per square inch (psi).

Once installed with pressure gauge connected, pump air into air line until pressure shown by gauge levels off at a constant maximum—indicating that all water has been forced out of the line. At this point, air pressure in the tube as shown by gauge just supports the column of water from water level in well to bottom of tube. This water column length is equal to the amount of air line submerged.

Deduct this pressure, converted to feet, (pounds pressure x 2.31 equals feet) from known length of air line to determine amount of submergence. For example:

Assume a length L of 150 ft.
Pressure gauge shows 26 psi.
Then distance from water level to bottom end of air line (B) is 26 x 2.31 or 60 ft.

Therefore distance of water level (A) is 150-60 or 90 ft.