No. 1358 Information Sheet November 2012

Installation and Construction of Rice Flood Depth Gauges

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Why use rice flood depth gauges?

As input costs rise and water resource conservation becomes more necessary, rice growers must continually refine their management practices to reduce the inputs necessary to grow a successful crop. One way to reduce water and energy costs is to make full use of the approximately 14–18 inches of rainfall that occurs during a "typical" Mississippi Delta rice growing season.[1] Saving water through conservation and the use of captured rainfall also lowers energy use by reducing the amount of pumping required. For each inch of water saved or captured per acre, a rice producer can reduce energy use by the equivalent of about 1 gallon of diesel fuel.[2]

A rice flood depth gauge[3] (Figure 1) is a simple, low-cost way for producers to monitor — from a distance — the status of their rice flood. By maintaining paddies less than full, producers reduce overpumping and increase rainfall capture.

How the gauge works

When a paddy has a full flood, the outer PVC float rises to cover most or all of the blue color painted on the metal conduit (Figure 1). When the water is low, the PVC float sinks to expose a red band, indicating that it is time to restart the pump.

Installation of rice flood depth gauges

Producers often install one depth gauge in the bottom bar-ditch of each paddy. The marker can be placed near the edge of the field where it can be seen easily from a vehicle because water is "level" with water all along the bar-ditch.

The best time to install a gauge is when the field is at full flood, which helps determine the proper depth to drive the metal support post into the soil. At full flood, the PVC float should fully cover the blue portion (top) of the support post. If there is a high spot in the paddy, you may adjust the gauge to reflect the flood

Figure 1. A simple rice flood depth gauge can help to save water, time, and money.

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depth at that point, thus avoiding the trouble of having to walk to confirm that water adequately covers the problem area.

To install the metal support post, slide the PVC float over the post and simply use your body weight to push the post into the mud to the appropriate depth. At full flood, the float should completely cover the painted depth gauge. If the sediment prevents pushing the post in by hand, use a rubber mallet to reduce damage (crimping) to the top edge of the conduit post. Installation should take less than 2 minutes per gauge in most cases. To avoid false readings, the post should always be vertical, never leaning.

For zero-grade field installations, use a shovel to dig an 8-inch-wide, 6-inch-deep well. Install the metal support post in the center of the well. This hole serves to keep the seine float from resting directly on the soil surface when the water is low, which could make it appear that more water is present in the field than actually is present.

Periodically confirm that each gauge reflects the actual flood depth and that it remains free-moving (e.g., float is not stuck to sediment or held down by weeds or algae).

Be sure to remove all depth gauges from the field before harvest and store them out of the weather during the off-season.

Construction of rice flood depth gauges

As shown in Figure 2, this design assumes that a maximum 4-inch flood depth is desired. Thus, each colored band on the indicator is 1⅓ inches wide. If a shallower total flood depth is used, adjust the colored band widths accordingly. The following materials are necessary for the construction of one gauge:

- 60 inches of ½-inch metal conduit pipe;
- 40 inches of ¾-inch PVC pipe;
- A 4½x3½-inch seine float with a ⅞-inch hole in the center that allows the PVC pipe to be inserted through the float without having to enlarge the hole.
- A 1-inch stainless steel hose clamp;
- 4 inches of wire to serve as a guard to keep birds from sitting on the indicator;
- A tube of waterproof construction glue;
- A 4-inch foam paint brush; and
- A sheet of sandpaper.

After the conduit and PVC pipe are cut to length, add a bead of waterproof construction glue to the outside of the PVC pipe. Push the pipe into the hole at the center of the seine float. When the glue is dry, use sandpaper to remove burrs from each end of the metal conduit. Lightly sand the area of the conduit that will be painted to improve paint adhesion. Use scissors to cut a 1⅓-inch gap from the center of the 4-inch foam paintbrush, leaving two 1⅓-inch bands on each side of the brush. This step saves time by allowing simultaneous painting of the blue (**top**) and red (**bottom**) depth indicator bands on the metal conduit. Assuming a 4-inch maximum flood depth is desired, each band is 1⅓ inches wide.

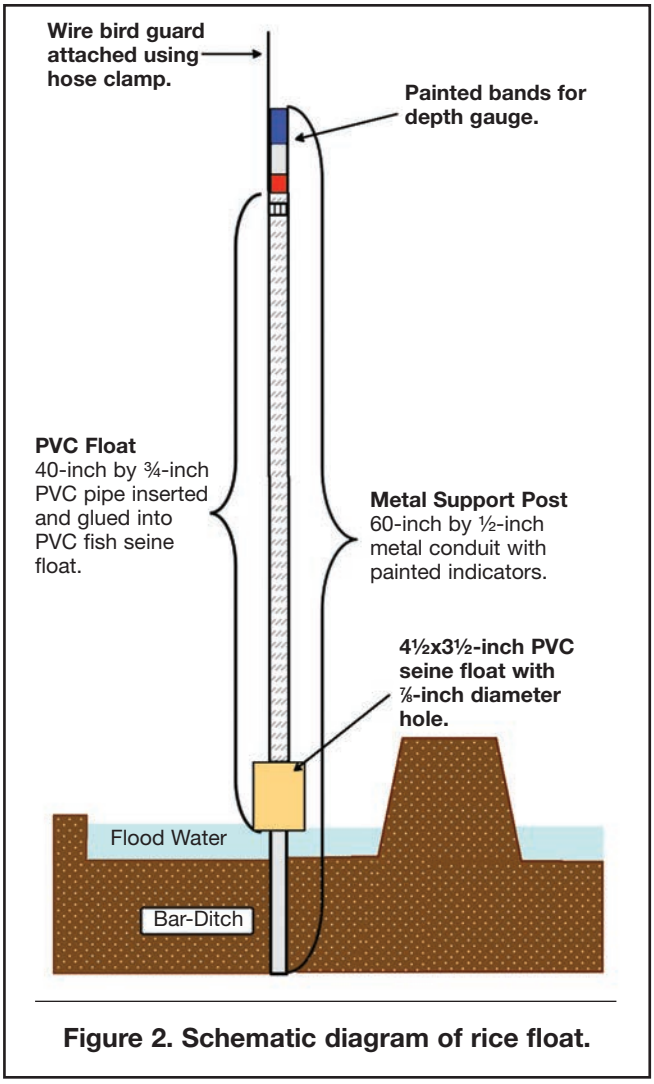

Figure 2. Schematic diagram of rice float.

Footnotes

[1]NOAA National Weather Service website.

[2]Hogan, R., et al. Estimating Irrigation Costs. University of Arkansas Cooperative Extension Service Bulletin FSA28. http://www.uaex.edu.

[3]Rice depth gauge modified using original design by L. Cramer of Iota, Louisiana.

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