

4 – Water-Seeded Rice

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Water-seeding rice is a common production method in southern Louisiana and areas in Texas and California. In recent years, Arkansas farmers have expressed more interest in water-seeding rice. The primary reason for water-seeding is for red rice suppression. Water-seeding can also aid in timely planting and reduce the risk of herbicide drift in areas where crops such as cotton are grown in close proximity to rice.

Field Preparation

The primary objectives in field preparation are to destroy winter vegetation and reduce the chance of seedling drift. Water-seeding presents many new problems to rice farmers that are not common in dry-seeding rice. The following information is a general outline of water-seeding procedures. Following these guidelines should reduce the potential of stand loss resulting in the need for replanting. A rough seedbed is essential. Leaving the soil ridged minimizes seedling drift. If drift occurs, there can be areas in the field with little or no rice seedlings and replanting may be necessary. On clay soils, this can generally be accomplished with a disk and/or field cultivator. The field should be left with large clods (baseball size or smaller) to allow seeds an area to settle without being subject to drift. On silt loam soils, the ridges created by the field cultivator may dissolve due to water movement and leave the soil surface smooth. Therefore, this method is not recommended on silt loam soils. The recommended method of final seedbed preparation before flooding on both silt loam and clay soils is to use an implement called a groover. It is similar to a flat roller with angle iron rings on 6- to 8-inch centers. The groover forms small furrows in the seedbed, and the weight of the groover packs the soil, preventing the wave action of the water from smoothing the soil surface. Packing the soil also creates a level seedbed which prevents high spots in the field where the soil may be exposed. Generally, high spots develop into areas that are heavily infested with weeds and/or red rice because of the lack of water coverage.

The recommended seeding rate for water-seeded rice is 30 percent greater than for drill-seeded rice. In water-seeded rice, the seed is on the soil surface and subject to blackbird depredation. Insects such as midge can also reduce rice stand density by feeding on the embryo as the seedling develops. Consult the RICESEED computer program for specific seeding rates for varieties in water-seeded rice.

Methods of Presoaking

In water-seeding, the rice seed can be dry or pre-germinated (presoaked). Pre-germinated seed is highly recommended. Pre-germinated seeds are generally soaked for 24 to 36 hours, drained 24 to 48 hours and then flown into the flooded field. The duration of the drain period is dependent upon the air and water temperature. Under cool conditions (50°-60°F), seedling development is slow and a longer drain period may be necessary; however, in warmer conditions (> 65°F), a drain period of 24 hours or less is usually sufficient.

In general, when rice is pre-germinated, about 50 percent of the seeds have the coleoptile emerging from the seed coat. This stage of seedling development is sometimes called 'piping'. Rice seeds treated with gibberellic acid (Release or GibGro) should not be used in water-seeded rice. Gibberellic acid promotes shoot development which could increase seedling drift.

When the rice is seeded dry, seeds are more likely to drift. If rice is presoaked, the heavy, wet seeds immediately fall into the grooves in the seedbed. **If Ordram or Bolero herbicide is used preplant, seeds must be presoaked.** One problem farmers have is determining the best soaking method when pre-germinating seed. Some farmers have built small grain bins which hold the seed and the water. After soaking and draining, the seeds are then augured into a truck prior to being flown into the water. Super (bulk) bags are often used to soak rice seed. The super bags are placed into a soak tank or pit. After soaking and draining, a boom is necessary to load

the seed into the plane. Various other methods are commonly used by growers to soak seeds. Consult county Extension agents or other growers for more information on pre-germinating seed.

Fertility

A large percentage of the nitrogen required may be preplant incorporated in water-seeded rice. Specific rates and nitrogen management practices for water-seeded rice are outlined in the "Efficient Use of Fertilizer" section.

Weed Control

Water-seeding rice is a cultural system that can be used to effectively control red rice. Water-seeding suppresses red rice and other grasses because the soil's oxygen is replaced with water once the field is flooded. A rule of thumb is that grass or rice will emerge (germinate) either through soil or water but not both. For the best red rice control, flood fields immediately after land preparation. This limits the amount of red rice seed that might germinate prior to flooding. The water-seeded system alone provides up to 50 percent red rice suppression when done properly. If herbicides such as Ordran or Bolero are integrated into the system, red rice suppression may approach 90 percent.

If Ordran 8E (4 pounds ai per acre) is used for red rice suppression, the herbicide must be soil incorporated immediately after application. Ordran also provides activity on barnyardgrass. Apply Bolero 8E (4 pounds ai per acre) after the field has been grooved. Bolero has activity on red rice, barnyardgrass and some aquatic weeds. After the surface application of Bolero or preplant incorporation of Ordran, flood the field in preparation for planting. Refer to the herbicide label and MP44, *Recommended Chemicals for Weed and Brush Control*, for product use information.

Some rice varieties are sensitive to both Bolero and Ordran in the water-seeded system; therefore, these varieties are not recommended for water-seeding. Because several varieties are sensitive to Ordran, consult the MP44 or your county Extension agent for additional information.

An adequate water supply is necessary for water-seeded rice. Fields should be small to ensure precise water management. Poor water management results in loss of both preplant nitrogen and red rice suppression. The methods of water management used in water-seeding rice are pinpoint and continuous flood. The pinpoint flood

is recommended especially if Ordran or Bolero is used preplant. In pinpoint flooding, the water is drained to allow seedlings to anchor (peg down) their roots in the soil. The soil should not be allowed to crust (dry). Using the pinpoint flood method, you should be able to flood the field within five days, and drain and reflood within three to five days for maximum red rice suppression. Thus, small fields with acreage of approximately 40 acres are desirable for optimum water management. During the drain period, the seedling is exposed to oxygen which promotes root growth for seedling anchorage. The drain period generally ranges from one to five days depending upon soil type and weather conditions. The field is reflooded with a shallow flood and the flood is increased as the rice seedlings develop. With the continuous flood method, the water is maintained at a constant level and is never drained. Seedlings may take longer to peg down and be more susceptible to drift with this method. This method is best used on precision leveled fields where a uniform, shallow flood can be maintained.

The flooded environment changes the weed species that may cause problems in water-seeded fields. Weeds such as ducksalad, redstem, gooseweed, eclipta, dayflower and arrowhead are aquatic weeds that may be more severe problems in water-seeded rice. The herbicide Londax has good activity on most of these aquatic weeds. Londax should be applied after the seedling rice has pegged down and the flood is stabilized as aquatic weeds are small and emerging. Londax should be applied at rates of 1 to 1.67 ounces per acre (product) for aquatic weed control. The best control is obtained when Londax is used before aquatic weeds become established or are just emerging. Alternative control measures for aquatic weeds include propanil, propanil tank mixed with Basagran or Grandstand after removing the flood or 2,4-D at midseason. Be sure to read the herbicide label(s) since use guidelines for water-seeded rice may differ from those for dry-seeded rice.

Insect Control

Rice water weevils can be a severe problem in water-seeded rice. The adult weevils are attracted to the open areas of water during early seedling development. Rice water weevil larvae cause damage to rice seedlings by pruning the root system. Root pruning occurs much earlier in water-seeded rice than in drill-seeded rice. Preventative treatments are generally required to control rice water weevil in water-seeded rice. Treatment thresholds and treatment options are given in the "Insect Management in Rice" section.