

Best Management Practices for Weedy Red Rice

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Introduction:

Weedy red rice is a major problem in rice production in many parts of the world. Red rice is present in just a few fields California. However, the number of infested fields has increased in the past years. Once red rice is established in a field, it is very difficult to eradicate due to the fact that red rice plants cannot be controlled with rice herbicides. Furthermore, red rice seed has a long dormancy period and is able to survive for a long time in the soil, meaning that eradication measures become more difficult if plants are allowed to produce seed. Yield reductions in the southern US are as high as 60% in red rice infested fields. If red rice contaminates other rice during drying and storage, extra milling and sorting is required, which increases costs and may cause cracking and reduce milling yields.

To prevent and eliminate infestations, follow these guidelines:

Equipment:

- Equipment coming into California from areas known to have red rice infestations will be subject to inspection by the County Ag Commissioner in the destination county.

Planting:

- Only use certified seed.
- Do not use infested field as a seed field.

During the season:

- Red rice plants are easiest to identify at the heading stage.
- For minor infestations, rogue red rice plants from the field. Be careful not to shatter red rice seeds while handling headed plants. Bag headed plants for transportation out of the field and dispose of in an appropriate manner (burn them or put in dumpster).
- For larger infestations, a burn down herbicide such as glyphosate may be used to kill red rice plants. Work with your Agricultural Commissioner to ensure compliance with pesticide use regulations.
- Keep the water on the field with no drainage during the season. Red rice germination is promoted when water is drained from field for stand establishment, foliar herbicide applications, etc.

At harvest:

- The affected field may be harvested but make sure you do not contaminate other fields by moving equipment that may carry red rice seed from one field to the next.
- The best option would be to harvest the affected field last in your sequence.
- If harvesting the affected field last is not possible, clean all harvesting equipment thoroughly before moving from the affected field to the next field.
- Straw should be cut as low as possible to the ground to facilitate burning.

- Make sure paddy rice does not get into the seed channel. Minimal moving and mixing of grain should help ensure this.

After harvest:

- Harvesting equipment (combine, bank outs, trailers, etc.) should be thoroughly cleaned *in affected field* to make sure there is no carry over of red rice seed to other fields.
- Cleaning procedures should include the removal of all plant material from the equipment including mud from tires or tracks that may contain seeds.

Winter management:

- If possible, burn straw in affected field. Prioritize burning fields with red rice infestations before burning other fields. Prioritization of infested fields will occur at the county level, so notify your County Ag Commissioner if your field is infested.
 - If straw was not cut as close to ground as possible at harvest, cut straw close to ground to reduce the amount of green plant material to obtain an effective burn.
 - Spread and fluff-up straw using a rake or other implement to achieve the most effective burn possible.
 - Burn field on day when conditions are most favorable for achieving an effective burn. A slow and intense burn is the most effective to kill red rice seeds.
 - Come back after the burn into affected areas with a propane burner (used in orchards for flaming weeds) to burn exposed seeds on the soil surface. This will provide more heat to destroy seeds than the open field burning.
 - Propane burner use will be more effective after removal of the majority of the plant material by open field burning and is also much safer.
- ***Do not perform*** fall tillage as this may bury red rice seed.
- It is unknown whether or not winter flooding affects red rice seed at this time, so infected fields can be flooded if the grower chooses to do so. Updated information will be forthcoming once more research is done.

Long-term management:

- Fallowing is the best approach to eliminate red rice from a field. Fallowing allows the maximum number of surface seeds to be destroyed. Use tillage or glyphosate on emerged plants.

Fallow management:

- Do not till before flooding in the spring
- Flood, block the drain and then allow the water to subside into the soil
- Wait for red rice to emerge (approximately 2 weeks), then spray with glyphosate.
- About 2 weeks after application of glyphosate, or when soil is dry enough for equipment, disc the soil.
- After discing, reflood, block the drain, and then allow water to subside into the soil
- Repeat the glyphosate application about two weeks after red rice seedling emergence.