



Weedy Red Rice

Luis Espino, UCCE

Red rice is a major problem in rice production in many parts of the world, including the US. Southern rice farmers struggle with red rice every year and many of their farming practices revolve around trying to manage this weed. In California, there are records showing that red rice was present in rice fields in 1932. A survey of rice seed conducted that year found that 42% of samples had anywhere between 3 and 57 seeds of red rice per pound of rice seed. The California rice inspection service at the time reported many instances of downgraded rough rice due to red rice.

Fast forward to 2003. Then, after many years of not seeing red rice in the field (maybe 50 years), six fields were identified as infested with red rice. What kept red rice under the radar all those years? No one really knows, but the use of certified seed and the practice of continuous flood probably helped ameliorate the problem. Maybe the re-appearance of red rice in 2003 was the result of an introduction from outside the state.

After the 2003 finds, the industry worked to limit the expansion of this weed. Affected growers rouged, sprayed, and in some cases took infested checks out of production altogether. These efforts seemed to put a stop to the spread of red rice. In 2008, a field survey was conducted by UCCE around infested fields to determine the spread of red rice, at that time thought to be limited to Glenn County. The survey found only three infested sites. Unfortunately, it seems that since then red rice has been spreading. Currently, about 15 fields are infested with red rice.

Why is red rice so problematic? Kernels produced by red rice have a reddish bran cover that cannot be completely removed with conventional milling. Quality guidelines allow only for up to 0.5% of red rice and damaged kernels in a milled rice sample for a lot of rice to be classified as US No. 1, and as the percentage of red rice in the milled sample increases, the grade is reduced further. In the field, red rice plants have more vigorous growth and tillering than cultivated rice, stealing resources and reducing yields. Additionally, red rice plants produce panicles during a longer period of time than cultivated rice, and the grain in those panicles shatters easily before harvest. Red rice seeds can remain dormant in the soil for years. Weedy red rice should not be confused with colored bran specialty rice varieties.

Red rice is the same species as cultivated rice, and therefore, all the herbicides that kill red rice also kill cultivated rice. In the southern US, rice growers rely on herbicide-tolerant varieties that have been bred to allow growers to use herbicides that would otherwise kill cultivated rice. These varieties are not available in California.

Stopping the spread of red rice is going to be a long process requiring cooperation between growers, processors and researchers. Because red rice is the same species as cultivated rice, there are no regulatory implications if a field is infested. Red rice is not a noxious weed or introduced pest subject to any control, suppression or eradication program. It is in the best interest of growers to communicate with Farm Advisors or Ag Commissioner's offices if they suspect red rice is in their fields to confirm the identity of this weed and implement a management plan.

Best Management Practices for Weedy Red Rice

University of California Cooperative Extension

- Rogue red rice plants from field, be careful not to shatter red rice seeds while handling headed plants. Bag headed plants for transportation out of the field and dispose in an appropriate manner (burn them or place on dumpster).
- 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 affect 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.
- Harvesting equipment (combine, bank outs, trailers, etc.) should be thoroughly cleaned to make sure there is no carry over of red rice seed to other fields.
 - Combine cleaning procedures should be similar to those used for cleaning equipment between harvesting seed fields of different varieties to minimize the risk of seed carryover.
 - This procedure should include the removal of all plant material from the equipment including mud from tires or tracks that may contain seeds.
 - Cleaning procedures should occur in affected field to prevent movement of red rice seed.
 - If bringing equipment from the southern US rice growing region, sanitize and inspect the equipment thoroughly before entering California.
- Burn straw in affected field.
 - If straw is 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 rice seeds.
- Come back after 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 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.
- Do not winter flood field.
- Once red rice is established in a field, it is very difficult to eradicate. Red rice seed has a long dormancy and is able to survive for extended periods. Fallowing is the best approach to eliminate red rice from a field.
 - When fallowing, apply an application of glyphosate to kill the spring flush of weeds. Follow this application by one or two irrigation flushes to promote germination of seeds on soil surface and spray resulting growth with glyphosate. Fallowing would allow the maximum number of surface seeds to be destroyed prior to them being buried by tillage. After fallowing, rotate to an alternate crop.
 - If returning to rice production after fallowing:
 - Do not use affected field as a seed field.
 - Absolutely keep the water on the field with no drainage during the season. Red rice germination is favored when water is drained from field for stand establishment, foliar herbicide applications, etc.
 - Scout field and rogue suspected red rice plants on a regular basis before seed has a chance to mature and shatter.

Winged Water-Primrose Update

Cass Mutters, UCCE

Winged Water-Primrose (*Ludwigia decurrens*) is a non-native weed that was identified in Butte County rice fields in 2011 and recently classified as an “A” rated weed pest and a “P” rated seed pest (prohibited). The current distribution extends over several square miles. Most infestations are along borders of rice fields and irrigation and drainage canals. Winged water-primrose flowers produce seed capsules at every leaf node starting when the plant is small (~ 1 foot tall). Seed capsules contain thousands of seeds, which are viable before the light brown seed coat is formed. Early monitoring and control are essential. The seed capsules can float on the water surface and are readily dispersed along irrigation canals. Also, part of the WWP root system floats in the water. Root segments will quickly produce new plants. Care must be taken when physically removing the plants to ensure that root segments are not allowed to move in the water canals. Mowing of levees as a means of control may potentially increase dispersal of this weed. Field observations also indicate that WWP is spread by tillage and harvest equipment. The Agricultural Commissioner is requesting that Best Management Practices (BMP’s) be followed in an effort to manage and control the weed.

For more information on red rice and winged water-primrose, including pictures, presentations, and management guidelines, visit the UC Rice On-line website at <http://rice.ucanr.edu>



Weedy Red Rice
Pictures &
UCCE red rice
identification guide



Winged Primrose
Pictures

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