

Rice Testing Services

Version 7.2022

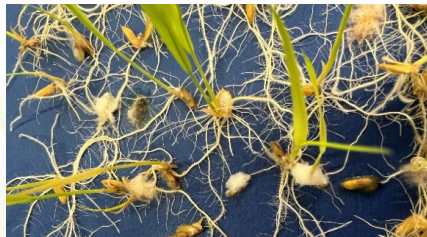


FIG. 1. Rice seedlings at 14 days. Note the fungal infection (*Fusarium spp*) on several seeds.



FIG. 2. Rice at 14 days on top of blotter. Note the strong root development.



FIG. 3. Rice seedlings emerging in a sand test at 14 days.

GERMINATION TESTING

Testing on the dry side is the general rule when conducting germination testing but rice is one of the exceptions. Rice is an annual warm season semiaquatic grass. Rice can tolerate moderate amounts of moisture, but caution should be exercised as an excess of water early in the testing period can inhibit root development in the laboratory setting. Rice is routinely tested on top of paper (Figure 1 and 2) at 20–30C without any dormancy breaking procedures. We also recommend the use of the sand germination test (Figure 3) to reduce light penetration which suppresses seed coat fungal growth and provides for uniform water uptake and emergence.

VIGOR TESTING

Cold tests are commonly utilized to measure vigor in rice lots. Samples are planted on chilled media and covered with cold sand. Samples are placed in the 10C chamber for 7 days and then moved to the 30C chamber for a warm period prior to evaluation. Normal seedlings are reported (Figure 4).

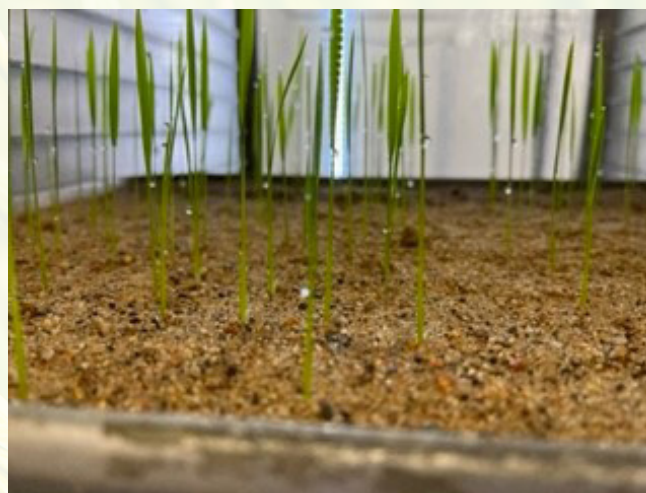


FIG. 4. Rice cold seedlings prior to evaluation.

ADVENTITIOUS PRESENCE (AP) TESTING

Adventitious Presence testing provides the client with an estimated level of unintended LL62/LL601 GMO event in the sample using semi qualitative testing strategies and Seedcalc (Version 8.1.0) statistical analysis. Rice is grouped into “pools” (30,000 seed in ten 3000 seed pools). DNA is extracted (Figure 5) from ground material and tested for the presence of specific DNA sequences utilized with LL62/LL601 gene insertion. The number of “pools” with positive or negative results for the specific LL62/LL601 DNA sequence and the total number of seed tested, and an estimated contamination level according to Seedcalc (Version 8.1.0) are reported for the submitted sample.

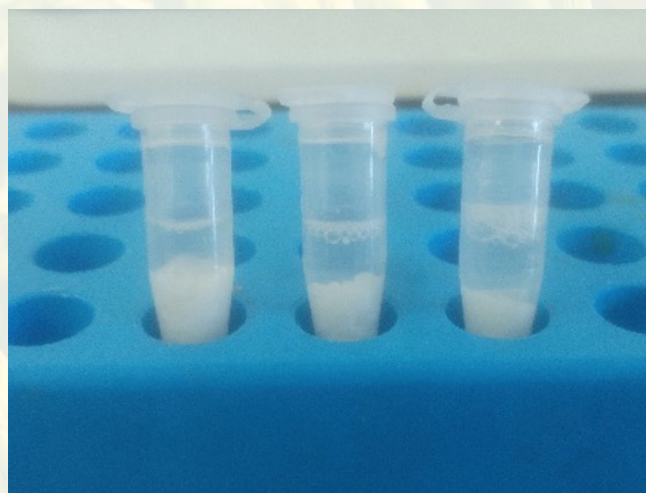


FIG. 5. Ground rice from individual pools in lysis buffer during extraction process.



FIG. 6. A rice dehuller mill is used to remove hulls prior to a red rice exam.



FIG. 7. Mixture of white and red rice caryopses after dehulling whole grain rice.

RED RICE TEST

Red rice is a problem in rice production that causes yield loss and reduction in grain quality. It cannot be controlled with traditional rice herbicides therefore, once established in fields, it can be difficult to eradicate. Some states require a red rice exam in order to certify seed for sale. At SoDak 500g samples are hulled using a Yamamoto rice huller (Figure 6). The rice caryopses are then visually examined for the presence of red rice and reported out as a percentage of red rice contamination (Figure 7).

LITERATURE CITED:

Seedcalc8. Version 8.1.0. Kirk Remund (US), Robert Simpson (US), Jean-Louis Laffont (FR), Deanne Wright (US), Sylvain Gregoire (FR). 2007. – Seedcalc8 is a Microsoft Excel® application that is written for Windows 2000 and XP. It can be used to design seed testing plans for purity/impurity characteristics including testing for adventitious presence levels of biotech traits in conventional seed lots. <https://www.seedtest.org/en/services-header/tools/statistics-committee/statistical-tools-seed-testing.html>