Plan Ahead To Minimize Rice Seedling Diseases

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Strong seedling vigor is an important quality that helps the seedling withstand early adverse conditions and increase the likelihood that the field will do well the rest of the season. All varieties do not emerge equally well on our different soil types. If you know the history of your rice fields, you can better match which variety should go to which fields; then you can manage them for maximum economic productivity.

Recently, at the Rice Research and Extension Center near Stuttgart, we grew 11 rice varieties in the greenhouse on heavy clay soil collected from a field that has a history of hydrogen sulfide toxicity (black root rot or Akiochi). Before we planted, we selected healthy, good-looking seeds for all the varieties so that we obtained comparable germination across the varieties. None of the conventional varieties were treated with any kind of seed treatments. The Rice Tec hybrids are likely treated with zinc and broad-spectrum multiple fungicides combined with gibberellic acid to enhance growth and to provide protection at seedling stage.

Preliminary data shown below from our greenhouse test may give you some idea on varietal germination differences on heavy clay soil. This is a one-time test and we have no current data from the field on seedling vigor for these varieties for comparison. From some field observation, Wells had shown a high emergence rate, as good as the hybrids. Medium-grain varieties had weak to moderate emergence rate, while the long-grain rice generally were moderate.

To improve emergence and crop stand in 2013, plan ahead and choose your varieties based on field history and the rice characteristics. In review of seedling stands in 2012, we saw most rice seedling diseases being related to herbicide damage, mostly Newpath drift or carry-over. We had a few cases of night-time freezing that caused brown-spot type symptoms in early April; with a few cases of salt injuries observed as well. However, "true seedling diseases" caused by Rhizoctonia, Pythium, and Fusarium etc were not as common. Seedling diseases associated with these pathogens show rotting or discoloration in the lower part of the stem, including the crown and roots.

Cold and wet environmental conditions are favorable for seedling diseases. In the presence of seedborne fungi, favorable soil moisture and temperature play great role in enhancing seedling diseases. In some cases seedlings die even after emergence under humid and warm environmental conditions. Seedling diseases may be severe in certain soils with rice after rice cultivation, heavy rice residue, and under minimum or reduced tillage. Water-seeded fields can have more seedling diseases than dry-seeded fields. Planting depth also plays role in severity of seedling diseases. As seedling diseases are complex, use higher rate of seed treatment containing mefenoxam, fludioxonil, metalaxyl, trifloxystrobin in combination of one or two for early planting or severe disease situations. For options of seed treatment, refer to the 2013 MP 154, Arkansas Plant Disease Control Products Guide page 49. Apply only using commercial seed treatment equipment and see labels for safety guides and more.

Rice Variety	Percent Emergence
AREXP1[a]	63
CL151	77
CL152	43
Francis	53
Jupiter	77
Roy J	80
RT CL XL 729[b]	85
RT CL XL 745[b]	90
RT XP 753[b]	80
Taggart	72
Wells	77

[a]New potential release from Arkansas in 2013 with high yield potential, conventional long grain traits.
[b]Possibly treated with zinc and broad-spectrum multiple fungicides combined with gibberellic acid. All other variety's seed was untreated.

Rice blast is one of the earliest known foliar diseases. The blast fungus survives in various ways but often is seedborne. To reduce seedborne blast, research suggests Dynasty fungicide (azoxystrobin) at a rate above 0.75 fl oz per cwt as adequate. However, note that this seed treatment will not guarantee protection later in the season. We, therefore, encourage field scouting, deep flood management, and foliar fungicides as needed.

In general, planting high-quality seeds treated with appropriate fungicides and insecticides minimizes seed rotting, encourages emergence, and produces vigorous seedlings. Gibberellic acid seed treatments may also be beneficial in fields with a history of poor emergence, particularly if you are planting a variety with moderate to weak seedling vigor. Before planting, make sure the seeds are all uniformly covered with the seed treatments. You pay a premium for the treatment and deserve your money's worth. Any untreated or under-treated seed is money lost and may reduce overall yield. Δ

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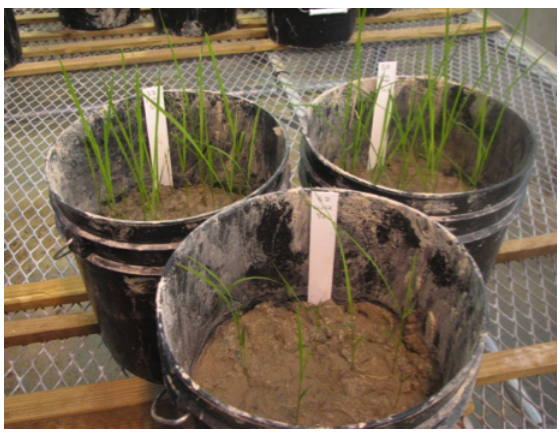

Fig. 1 – CL 151 (back left), RT CL XL 745 (back right), CL 152 (front).

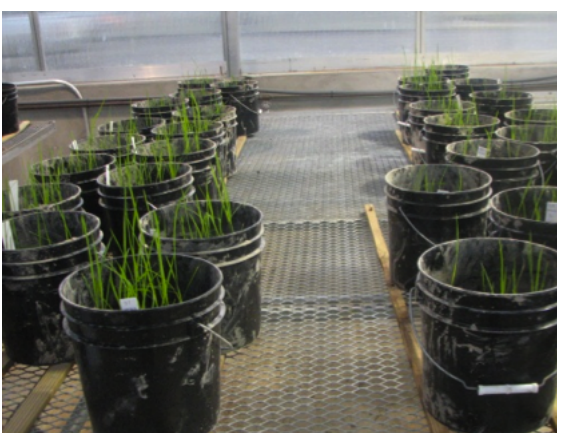

Fig. 2 – Seedlings of 11 varieties in three replications on heavy clay soil with history of Akiochi rice disease. Twenty seeds were planted in each pot.