



Leadership and Innovation Within the Field of Rice

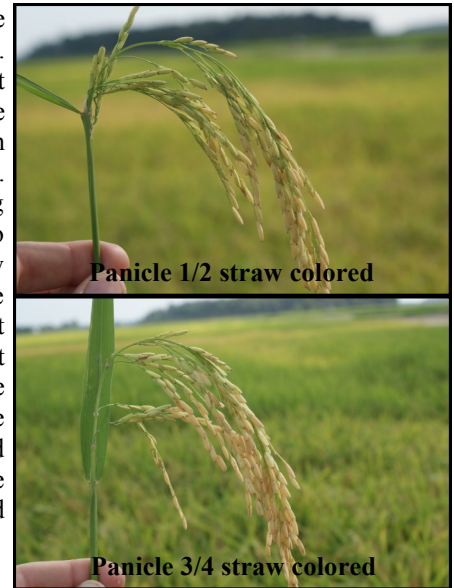
Harvest Considerations

Garrison Hardke

Market pressure has made 2015 a year where rice farmers needed everything to go in their favor. While there have been plenty of bumps in the road, the majority of the crop looks good. We have had some nights that stayed above 75 degrees during pollination and grain fill, which is not good, but nothing to the extent of 2010-2011 where there were widespread quality issues. Harvest is in full swing in Gulf Coast region and moving North. Many in the Mid-South region are draining rice, with a few fields ready to be cut. Here are some tips to help you finish strong this year.

Draining Rice

When terminating irrigation, several major factors must be considered, including soil type, field slope, and field size. The 10 day forecast may also be considered if extreme heat is expected. Since few fields are identical, it is best to judge each field on its own merits. Flat fields with clay soils can stay muddy for an extended period following drainage. Because of this, you can drain them earlier to avoid rutting at harvest without stressing the rice. It is usually safe to drain these fields when half of an average panicle is straw colored. Fields with silt loam soils and contour levees are more difficult to judge. Silt loam dries faster than clay, but these fields take longer for the water to run off because it has to pass through each paddy. Here, paddies at the top are often dry and cracking while water is still draining from the bottom, especially in large fields. To avoid potential yield and quality loss, it is best to wait a little longer before draining these fields. In this situation, we recommend draining when average panicles are 2/3 to 3/4 straw colored.



Harvest Aids

Some growers choose to apply a desiccant such as sodium chlorate prior to harvesting a field to help them get started quicker. The general recommendation is to 3-6 lbs. of active ingredient per acre, at or below 25% grain moisture. Expected harvest should be 3-5 days after application and weather should be taken into account to avoid exposure to wind and rain. Desiccants make the rice plants more fragile, so avoid applying if severe weather is expected.

Harvest Moisture

RiceTec recommends that all of our hybrids be harvested at 18-20% moisture. Data shows that milling yields are highest in this range, and becomes more inconsistent as the moisture drops. Mature grain is most susceptible to loss when it is exposed to rewetting from rain, which can cause fissuring and reduce milling yields. Some growers choose to start harvesting above 20% moisture in order to get ahead if a large portion of acres are ready at the same time. This is not a problem as long as there are not many immature or milky kernels.

On-Farm Drying and Storage

Rice growers in recent years have made major investments in on-farm drying and storage facilities. This has been valuable in increasing harvest efficiency and allowing flexibility in marketing the crop, but also adds responsibility in managing final quality of the grain. Rice should be dried to approximately 12% moisture as soon as possible for proper storage. If adding external heat, be very careful when drying with air above 100° F. Avoid mixing high and low moisture rice in the same bin, as this will cause inconsistent drying and moisture readings, and potentially lead to damaged rice. Maintain clean facilities to help prevent pests, and check equipment to avoid preventable failures.

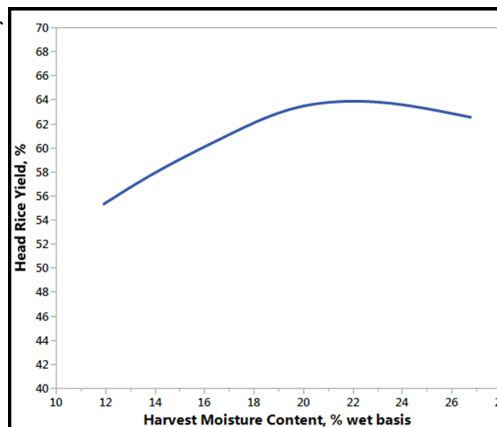
- Check our website for the latest news, yield forecasts, and economic models.
- For BASF Clearfield® System use and stewardship guidelines, visit the RiceTec or BASF website.

Harvest Moisture vs. Milling Quality

Garrison Hardke

The question of rice quality and how it relates to harvest moisture is always a point of discussion this time of year. When to start harvesting is a major part of the discussion, as growers are considering several factors. Milling quality, drying costs, and harvest logistics all play a role in this decision, and priorities vary from farm to farm.

For rice hauled to commercial mills and dryers, drying costs typically drop significantly below 22% moisture. Many growers that utilize on-farm storage are reluctant to store rice in their bins above 20% moisture, unless they have a sophisticated system. Logistics can be a concern if a large portion of the crop is maturing at the same time, or if long lines at the dryer are an issue. RiceTec's recommendation is to harvest at 18-20% moisture. This is typically the "sweet spot" that balances milling yields with drying costs.



The chart to the right illustrates the general parabolic relationship between harvest moisture content (HMC) and head rice yield % (HRY). This represents over 900 data points for various rice cultivars taken from Jonesboro, AR and Alvin, TX from years 2012-2014. Optimal HMC to obtain the highest milling yields is typically 18-23% moisture. HMC above 24% tends to have more immature kernels that are weaker when dried and milled, reducing HRY. Rice harvested at low moisture (below 14%) may contain kernels that have fissures due to rewetting of the mature grain from rain or heavy dew. Fissured kernels are more likely to break during milling, reducing HRY. Understanding this relationship between harvest moisture and milling will better enable growers to make informed decisions around harvest. As always, contact your local RiceTec representative if you have questions or need assistance.

WOTUS Update

Steven Hensley– USA Rice

Barring any legislative fix, EPA and the Army Corp of Engineers' final rule, *The Clean Water Rule: Definition of Waters of the United States*, more commonly known by the draft rule, *Waters of the U.S.* (WOTUS), will become effective on August 28.

All indications are that this is a significant increase of jurisdiction by the agencies over what they used to regulate, despite the fact that EPA claims this rule is just a clarification of existing jurisdiction and not an expansion. It's important to note that this rule came about after two rulings (*SWANCC* and *Rapanos*) by the Supreme Court that limited the agencies' jurisdiction and required that they show a "significant nexus" of "isolated waters" to bona fide "waters of the U.S."

It's also important to note that rice fared better than many other agricultural crops and industries in the final rule. For example, rice fields were excluded from jurisdiction and were allowed to have other uses such as crop rotation and hunting. Normal farming practices exemption, prior converted wetlands exemption and irrigation return flow exemption were also kept in place. What was so confusing was the expansion of jurisdictional areas related to tributaries and ditches – up to 4,000 feet from a defined tributary in some cases – and tributaries defined in such a way that many believed that a low runoff area in a grassy field could count the same as a major perennial stream. What was certain was that the agencies' stated use of remote sensing data would allow citizen lawsuits to increase since the activists wouldn't have to actually visit a site and 'see' a problem.

But last week the House Committee on Oversight and Government Reform released more than 50 damaging pages of documents in which the Army Corps of Engineers sometimes strongly disagreed with the U.S. EPA on the process of drafting the final rule. Some of the memos sought the removal of the Corp's logo from the final documents, as well as removing them as an "Author, co-author, or substantive contributor." The Corps even sought to remove the term "agencies" when the reference included the Corps along with EPA.

Referring to specific points in the final rule, the memos stated, among other things, that the "4,000 foot bright line rule is not based on any principle of science, hydrology or law," rendering both therefore, "legally vulnerable." Perhaps more importantly, a Corps memo stated that the final rule was "Inconsistent with SWANCC and Rapanos," the two Supreme Court decisions that the final rule was supposed to clarify.

Using these latest documents USA Rice will continue to press Congress and the Administration to respond to the issues and fix this rule.

** This article is a special submission to update our customers on an important regulatory matter affecting rice farmers. Mr. Hensley is Senior Director of Regulatory Affairs at USA Rice.*

Herbicide Tolerance Enhances RiceTec's Portfolio

Weeds are one of the most difficult and expensive issues facing rice producers globally. In developed nations, herbicides and flooding are the primary methods for controlling weeds. In other nations, flooding, transplanting, and hand removal are the relied-upon techniques. Consequently, an opportunity exists for herbicide tolerant traits in rice. Herbicide tolerant (HT) crops are designed to tolerate specific herbicides, which kill the surrounding weeds, but leave the cultivated crop intact. Weed control is a crucial component in achieving the full potential grain yield of any given variety or hybrid, as well as ensuring a strong return on investment.

In order to be effective, herbicides must be absorbed by plants, move within the plants to the site of action without being deactivated, and reach toxic levels at the site of action. Most herbicide tolerant traits in other crops were developed through transgenic manipulation or GMO technology. This technology has not been accepted in rice at this time. The herbicide tolerance technology that RiceTec is exploring is based upon mutation breeding and is non-GMO.

The popular Clearfield system is a non-GMO crop technology for rice production, developed with traditional plant-breeding techniques (mutation breeding). RiceTec licenses this Clearfield system from BASF to provide IMI herbicide tolerance in a portion of our hybrid portfolio. The Clearfield system consists of amino acid synthesis inhibitors which act on a specific enzyme to prevent the production of specific amino acids. The main benefits of the Clearfield system are 1) it covers a broad spectrum of both grass and broadleaf weeds, 2) it's easy to use, and 3) it provides good crop tolerance.

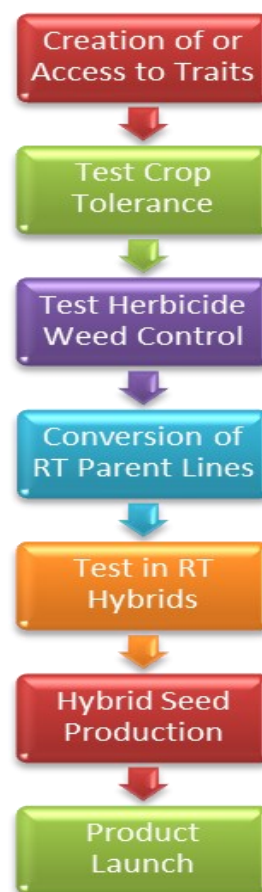
The Clearfield system also has some limitations. It carries slightly increased production costs, and good stewardship practices require crop rotation out of Clearfield rice. The third limitation is the development of resistant red rice and other weeds. Cross pollination occurs because red rice is the same species as cultivated rice. When cultivated rice is treated with Clearfield herbicide, a few red rice biotypes may survive. This causes a potential cross-pollination situation between cultivated rice and red rice, thus creating red rice that carries Clearfield trait resistance. As a result, complementary systems are needed to control the resistant red rice.

Therefore there is a need for new alternative herbicide systems. In addition to collaborating with 3rd party technology providers, RiceTec is also developing its own set of proprietary non-GMO herbicide tolerant traits for rice. These new herbicide tolerant traits include ACCase and HPPD. Inhibitors of the ACCase enzyme in plants prevent the formation of fatty acids, components essential for the production of plant lipids. HPPD herbicide technology consists of pigment synthesis inhibitors. They act by preventing plants from forming photosynthetic pigments, causing the affected plant parts to appear bleached.

Several RiceTec teams are working together to develop the high quality, dependable herbicide tolerant hybrids and varieties to meet or exceed our customer needs and expectations. The process requires rigorous attention to compliance with standards in all areas of development, production, testing, and customer service. Good management and training at the farm level are also critical to success. It is expected that RiceTec will be ready to go to market with new HT products in 2017.

Ken Fearday

HT Process





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**RiceTec Newsletter
Harvest 2015**

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- Harvest Moisture vs. Milling Quality
- WOTUS Update
- Herbicide Tolerance Enhances RiceTec's Portfolio

District Manager Contacts

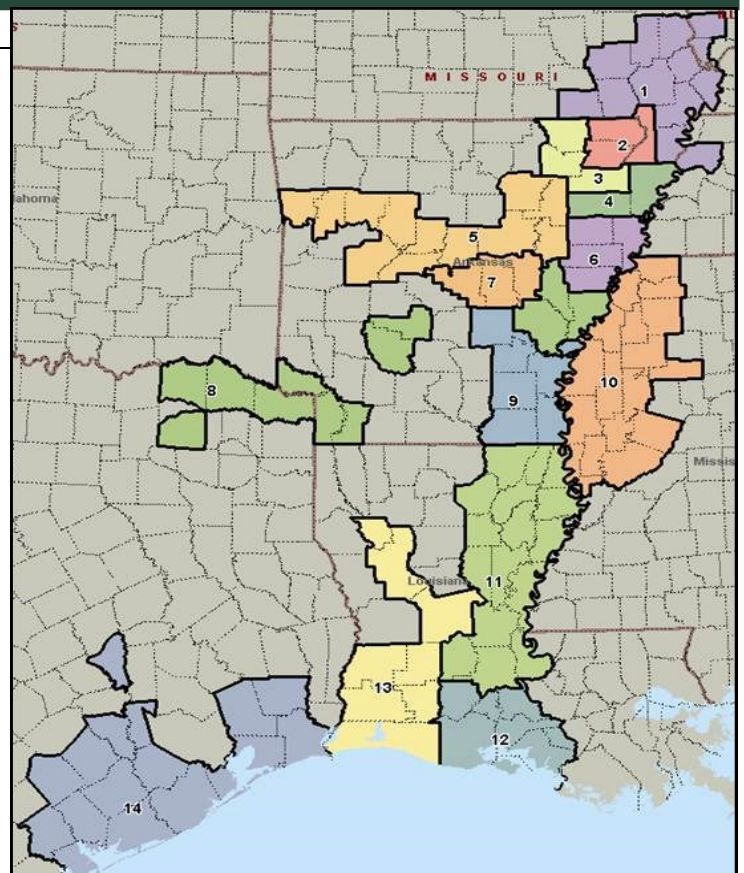
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