For 15 years, the Clearfield® Production System for rice has been providing growers with a rice stewardship program that helps manage tough weeds and maximize yield potential. Now, from that same partnership that brought you the Clearfield Production System for rice, there’s a new way forward for rice production. Introducing the Provisia™ Rice System, the newest innovation in rice from BASF.

Red rice has plagued rice production in the southern United States for decades. Because it is physiologically similar to commercially cultivated rice, herbicides that would control red rice would damage commercially cultivated rice. To achieve some level of red rice control, farmers manually rogued fields, water-seeded and rotated to other crops, such as soybeans and cotton.

In the 1990s, rice researchers at the LSU AgCenter discovered a mutation tolerant to imidazolinone chemistry — the active ingredient in BASF’s Pursuit® herbicide. BASF and LSU AgCenter formed a partnership to bring forward the Clearfield Production System for rice, which was launched in 2002.

“Clearfield is an amazing technology utilized on more than 14 million acres of rice here in the United States,” says Nick Fassler, Manager, Technical Marketing Group, BASF. “Newpath®, Clearpath® and Beyond® herbicides are ALS inhibitors that control red rice in varieties and hybrids containing the Clearfield trait. To maintain the sustainability of the Clearfield Production System in rice, stewardship guidelines require Clearfield rice to be rotated with soybeans and not planted in consecutive years.

“To help minimize emerging weed resistance and to allow rice farmers to plant more sustainable rice in a three-year rotation, BASF soon saw a need for an additional technology. Our plant science group determined the ACCase technology, which is now Provisia™ herbicide, would be a good partner to use in rice because it is a different mode of action than the ALS inhibitor herbicides. During the selection process, the BASF group found an ideal ACCase herbicide-tolerant mutation in rice and successfully grew the cells into a rice plant in its lab.

“BASF worked with the LSU AgCenter rice-breeding team under the leadership of Dr. Steve Linscombe to incorporate the ACCase herbicide-tolerant Provisia trait into local germplasm to develop a variety that was a good agronomic fit for the entire Delta rice region.”

As a result, “BASF is strengthening and extending its rice portfolio, which already includes the Clearfield Production System for rice,” says Allison Romick, BASF Senior Market Manager, Crop Protection, North America. “The Provisia Rice System is composed of Horizon Ag’s PVL seed, and its first variety — PVL01 — carries the Provisia trait, which allows growers to safely apply BASF’s Provisia herbicide.”

Provisia technology, combined with the proven technology of Clearfield, gives growers rice-planting flexibility on more acres while rotating different herbicide modes of action — ALS, ACCase — for sustainable management of red rice, resistant rice types and annual grasses. The new Provisia technology offers rice growers a complete three-year rotation of Provisia rice, Clearfield rice and soybeans, and an optional fourth year of conventional rice, allowing them to sustainably grow more rice over more acres.

Additionally, the Provisia Rice System allows rice acres lost to weedy rice to come back into production at least two years sooner than traditional management recommendations.
originally, Clearfield technology changed the rice game in the United States by effectively controlling red rice and other challenging weeds (grasses, sedges, broad leaves, volunteer rice). With BASF’s commitment to bringing new technologies to the forefront for rice farmers, the Provisia™ Rice System extends the life of the Clearfield Production System for rice, giving growers an additional tool to control red rice, resistant weeds (weedy rice) and other annual grasses. Returning this power and control to rice growers allows them to grow sustainable rice to protect the future of the crop.

Farmers will have three unique BASF offers in the rice market: Provisia Rice System, the Clearfield Production System for rice and conventional rice. The Provisia Rice System is an excellent complement to the Clearfield Production System for rice, providing growers with multiple solutions to control red rice, weedy rice and other challenging annual grasses. By following responsible stewardship practices, rice farmers will realize these benefits:

- The ability to have an additional rice rotation.
- Clean fields so they can focus on other parts of their operations and lives.
- Simplified farm management.

“The use of the Provisia Rice System followed by Clearfield Production System for rice helps to manage weedy rice types, which ensures uniform maturity of the crop and more uniform grain going to the mill,” says Donnarie Hales, BASF Product Manager. “When the Provisia Rice System is used in rotation with the Clearfield Production System for rice, growers can plant rice in a rice-rice-soybean rotation, increasing their options for rice production.”

**How The Provisia Rice System Works**

First, plant PVL01 in fields that were planted to soybeans or conventional rice — not Clearfield rice — last year. Next, make note of these field observations from Horizon Ag.

- The seeding rate will range from 50-70 pounds per acre. PVL01 tillers very well, and the lower seeding rates can be used with this variety as long as the seed is treated with a fungicide/insecticide seed treatment. The higher end of the seeding rate range is for heavy ground and non-optimal seeding conditions.
- The nitrogen rate is 150-180 pounds nitrogen per acre (lbs N/A). PVL01 will require a little more fertilizer than other pure line varieties, approximately 20-30 lbs N/A more. Nitrogen should be applied in a two-way split with the bulk of the fertilizer applied preflood on dry ground and the remaining 46 lbs N/A applied three weeks after permanent flood establishment.
- PVL01 is susceptible to blast and sheath blight, so scouting for fungicide timing is crucial.
- More information on the ratoon potential of PVL01 will be available in 2018.
Achieve Efficient Weed Control In PVL01

Two applications of Provisia™ herbicide are needed for full-season grass control, including barnyardgrass. If broadleaf weeds are present, tankmix a broadleaf herbicide with Provisia herbicide in the first application. After making the second application of Provisia herbicide, growers put on the flood to prevent other grasses from germinating.

“We recommend starting off clean with Command® and Sharpen® herbicides for residual grass and broadleaf control or Prowl® herbicide as an early post treatment for residual grass control,” says Alvin Rhodes, BASF Senior Technical Service Representative for Mississippi, Louisiana and southeastern Texas. “The Provisia™ Rice System also requires two applications of Provisia herbicide because red rice will germinate through the season before permanent flood.

“The timing range is from 1-leaf rice up to panicle initiation. Ideal timing for the Provisia herbicide early post application is 1- to 2-leaf rice. Applying a second pre-flood shot of Provisia herbicide at 4- to 5-leaf leaf rice — about two weeks after the first application — will take out any red rice that has germinated later in that system.”

John Schultz, BASF Technical Service Representative for Arkansas and the Missouri Bootheel, says, “It’s important to make both Provisia herbicide applications for two main reasons: 1) to manage any grass weeds that may have emerged after the first application and 2) to manage potential resistance development from grass weeds that may have been missed or did not get good coverage. The second application of Provisia herbicide is needed to ‘seal the deal.’”

Provisia herbicide can be applied by ground or air. A minimum of 10 gallons of water per acre (GPA) is recommended by ground and 5 GPA is recommended by air. Good, thorough coverage is required for efficient weed control.

Q & A With BASF Technical Service Representatives

**Alvin Rhodes:** Senior Technical Service Representative for Mississippi, Louisiana and southeastern Texas

**John Schultz:** Technical Service Representative for Arkansas and the Missouri Bootheel

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**Q** Can PVL01 — the Provisia rice variety — be planted in a field that was planted to Clearfield rice the year before?

**A** Rhodes: No. Clearfield rice treated with Newpath®, Clearpath® or Beyond® herbicides has an 18-month rotation to any other rice — Provisia or conventional. PVL01 may be planted in a field following soybeans or conventional rice. The ideal field in which to plant Provisia rice would be one following soybeans where resistant red rice plants are present.

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**Q** Does Provisia herbicide control sedges, such as nutsedge, rice flatsedge and smallflower umbrella sedge?

**A** Schultz: Provisia herbicide controls red rice, weedy rice and other annual grasses. It does not control sedges. If sedge control is desired, include an appropriate tankmix partner such as Permit herbicide.

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**Q** What is “weedy rice?”

**A** Rhodes: Weedy rice is a term to describe rice that is resistant to ALS herbicides — such as Newpath, Clearpath or Beyond — outcrossed red rice, hybrid seed that has shat tered and emerged or other off-type rice that you don’t want in a commercial rice field.

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**Q** How long will it take to see results after Provisia herbicide is applied to a rice field?

**A** Schultz: Similar to what we observe in the Clearfield Production System for rice, it will take 7 to 14 days to see the results of a Provisia herbicide application.

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**Q** What herbicides should not be tankmixed with Provisia herbicide?

**A** Rhodes: Do not tankmix Provisia herbicide with herbicides containing the active ingredients triclopyr or propanil. If necessary, these may be applied sequentially two to three days after the Provisia herbicide application. This allows Provisia herbicide to get into the plant and start working, allowing the best utility out of all the chemistries.

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**Q** Why should the broadleaf tankmix partner be included in the first Provisia herbicide application and not the second one?

**A** Rhodes: With ACCase herbicides, such as Provisia herbicide, typically there is a chance for antagonism with some broadleaf herbicides. Antagonism means a decrease in grass control, not a decrease in broadleaf control. That’s why it’s important to tankmix the broadleaf material in the first Provisia herbicide application. It’s also important to apply Provisia herbicide at 15.5 fluid ounces per acre to offset any antagonism concerns. And then apply Provisia herbicide alone at 15.5 fluid ounces per acre or Provisia herbicide with Permit® herbicide in the second application, so Provisia herbicide is at full strength to clean up any grasses that might be present as a result of antagonism (decrease in grass control), which may have occurred in the first application.

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**Q** Why is Permit herbicide an acceptable tankmix partner in the second application?

**A** Schultz: We have observed minimal antagonism between Provisia herbicide and Permit in the second application year after year in BASF research trials.

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**Q** Does Provisia herbicide require an adjuvant?

**A** Rhodes: Yes. A good crop oil concentrate (COC) at 1% volume/volume (v/v) or 1 pint per acre minimum is required.
At a time when the rice industry is looking for new technologies and innovations to come to market, BASF and Horizon Ag, two industry leaders, are once again coming together to bring forward solutions that improve profitability for U.S. rice producers.

“PVL01 yields are very similar to CL111 in most regions, and the milling and cooking quality is exceptional. PVL01 also has the lowest chalk potential of the Horizon Ag varieties — even lower than CL172. This exceptional quality is catching the attention of foreign buyers.”

Tim Walker
General Manager, Horizon Ag

“BASF looks forward to bringing key herbicide innovation to the table through this partnership and through the Provisia™ Rice System,” says Donnarie Hales, BASF Product Manager.

Horizon Ag General Manager Tim Walker says Horizon Ag also is pleased to partner with BASF to bring Provisia rice to market in 2018.

“Provisia is an important new technology that will enable rice growers to achieve better control of costly weeds that have the potential to impact yield and quality,” Walker says. “Horizon’s purpose is to help ensure the long-term viability of the U.S. rice industry. Strong partnerships with BASF, LSU AgCenter and other breeding institutions, and the rice seed industry as a whole, allow us to deliver top-performing, high-quality rice seed to growers working to produce more rice at a higher profit level without jeopardizing the end-user.

“PVL01 — the first Provisia rice release — will be launched on approximately 100,000 acres of rice throughout the southern USA in 2018 and that number is expected to double in 2019. LSU AgCenter is developing new material in a rapid manner. We look forward to working closely with BASF, LSU AgCenter and our seed industry partners in the coming months as we get closer to the commercial launch of this technology.”