

Program 12R-1

► New Innovations For Rice From BASF

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Several new innovations are being introduced to benefit rice production by BASF. These innovations include: Sharpen® herbicide for preemergence and early postemergence control of broadleaf weeds; Sercadis® fungicide for sheath blight control; and Limus® nitrogen management to prevent ammonia loss when combined with urea containing fertilizers. BASF is also developing the Provisia™ Rice System for control of red rice and other grasses in rice.

Sharpen® herbicide is a new tool for in-season use for burndown and residual weed control in rice. This herbicide can be applied preplant, preemergence or early

postemergence from 2-leaf rice up to internode elongation. The Sharpen rate is 2 fl oz/A preplant or preemergence and 1 fl oz/A when applied early postemergence. It provides burndown control of broadleaf weeds with residual weed control during early rice growth and development. Sharpen controls key broadleaf weeds including Palmer amaranth (*Amaranthus palmeri*), horseweed (*Conyza canadensis*), morning-glories (*Ipomoea* spp.), and Texasweed (*Caperonia palustris*). Sharpen early postemergence applications on rice require a crop oil concentrate adjuvant instead of a MSO. Sharpen should not be tank mixed with other herbicides that are formulated as emulsifiable concentrates (EC) due to an increase in crop response.

Sercadis® fungicide, fluxapyroxad, is a new fungicide in the carboxamide class of chemistry for control of sheath blight, *Rhizoctonia solani*, in rice. Sercadis should be applied between panicle differentiation and late boot stage when environmental conditions favor disease development at a rate of 4.5 to 6.8 fl oz/A. Sercadis provides a new mode of action for rice growers to combat sheath blight, including QOI resistant sheath blight. Sercadis will be an invaluable tool in a resistance management strategy for sheath blight control. Best use recommendations of proper rate and proper carrier volume for coverage are also critical resistance management strategies for rice growers. A field study was conducted to evaluate three aerial application volumes for efficacy of controlling *Rhizoctonia solani* with Sercadis. Results indicate that the 10 gallon per acre application volume provided better plant coverage and disease control than 3 or 5 gallons per acre. A laboratory study was conducted to evaluate the systemicity of Sercadis in the rice plant. Rice plants were inoculated with *Rhizoctonia solani* under high humidity. Evaluations at 10 days after treatment found that *Rhizoctonia solani* severity level was less than 1 (scale of 0-9) as compared to other fungicides that were at levels of 2 or higher. Fluxapyroxad has unique movement and binding properties which provide systemic control of *Rhizoctonia solani* in rice. Fluxapyroxad has acropetal translocation (moves the leaf tips) and pervades the entire cross-section of the leaf. Due to its excellent systemic distribution, fluxapyroxad also protects those parts of the leaf that were not reached during spraying.

Limus® nitrogen management blocks urease activity in the soil. Urease is an extracellular enzyme produced by plants and microbes that enters the soil through exudation or when plants and microbes die and decompose in the soil. This enzyme has an active site that can bind urea, and hydrolyze it to ammonia and carbon dioxide. When ammonia and carbon dioxide leave the active site, the site is free to hydrolyze another urea molecule. Limus urease inhibitor works by binding to the active site and blocking the urea from binding. This prevents urea hydrolysis and therefore reduces ammonia formation. Limus contains a blend of two different urease inhibitors that together are more effective than a single inhibitor. This includes the proven urease inhibitor, NBPT, along with a BASF proprietary urease inhibitor, NPPT. BASF field trials have shown Limus provides excellent protection against ammonia loss in rice. Ammonia loss traps were utilized to evaluate the performance of Limus treated urea compared to untreated urea. On average, untreated urea losses in rice were near 20% in replicated research trials in the gulf region. Limus treated urea losses in comparison were below 5%. On average there was a 14% increase in rice yield. A positive yield response depends on a number of factors, including days following urea application before rainfall, actual nitrogen requirements of the crops compared to estimated needs, and residual soil nitrogen. Limus technology provides the potential for higher yields by protecting against nitrogen loss, as up to 40% of surface applied nitrogen can be lost from volatilization (depends on soil structure and climate conditions). This allows for nitrogen to be available when the plant needs it, making a one-

time application convenient and economical.

The Clearfield® Rice System has been used since 2002 to control a wide range of weeds, especially red rice and barnyardgrass. This non-GMO herbicide tolerant system utilizes Group 2 Acetoacetate synthase (ALS), Newpath and Beyond herbicides. In the past few years, outcrossing of the Clearfield herbicide tolerant trait in red rice has been documented in a few rice growing areas. As an alternative method for control of red rice and other grasses in rice, BASF is developing a new non-GMO rice, Provisia™ Rice System. This rice will be resistant to a Group 1 Acetyl CoA Carboxylase (ACCase) inhibitor herbicide, quizalofop-p-ethyl. The Provisia Rice System will enable postemergence control of grasses including ALS resistant red rice and barnyardgrass.