Cooperative Extension, University *of* California

Rice Leaf

Butte County Prepared by: Cass Mutters, Farm Advisor August 2011

DON'T FORGET THE RICE FIELD DAY!

Wednesday, August 31, 2011
Rice Experiment Station (RES), Biggs, CA

The annual Rice Field Day will be Wednesday, August 31, 2011, at the Rice Experiment Station (RES), Biggs, California. You and your associates are cordially invited to join us to observe and discuss research in progress at RES. The Rice Field Day is sponsored by the California Cooperative Rice Research Foundation and University of California with support from many agricultural businesses.

7:30 - 8:30 A.M.	**REGISTRATION** • Posters and Demonstrations
8:30 - 9:15 A.M.	**GENERAL SESSION** • CCRRF Annual Membership Meeting • D. Marlin Brandon Rice Research Fellowship • California Rice Industry Award
9:30 – NOON	**FIELD TOURS OF RICE RESEARCH** • Variety Improvement • Disease Resistance • Insects and Control • Weeds and Control
NOON	**LUNCH**

The program will begin at 8:30 a.m. with a General Session that serves as the Annual CCRRF Membership Meeting. Posters and demonstrations will be in place during registration until after lunch. Field tours of research will emphasize progress in rice variety improvement, disease, insect, and weed control. The program will conclude at noon with a complimentary luncheon. The RES is located at 955 Butte City Highway (Hwy. 162), approximately two and one half miles west of Highway 99 north of Biggs, California.

Armyworms

Luis Espino, UCCE Colusa County

I've been receiving reports of high armyworm populations this summer. You can always find some armyworms in rice fields, but I have rarely seen fields that needed a treatment due to armyworm injury. Growers that have farmed for a while tell me that every few years they see armyworm populations spike to the point that treatments are needed, but most of the time armyworms are of no concern. This is shown in Fig. 1, where the percentage of planted acres treated with insecticides registered for armyworm control in the six major rice producing counties of California (Butte, Colusa, Glenn, Sutter, Yolo and Yuba) increased in the late 1990s and early 2000s, but has remained below 5% since then.

Three insecticides are registered for armyworm control: lambda-cyhalothrin, zeta-cypermethrin and carbaryl. Lambda-cyhalothrin and zeta-cypermethrin are pyrethroids, while carbaryl is a carbamate. As shown in Fig. 1, pyrethroids have become the main insecticide used against armyworms since their introduction in 1996, while carbaryl use has seen a significant reduction in use.

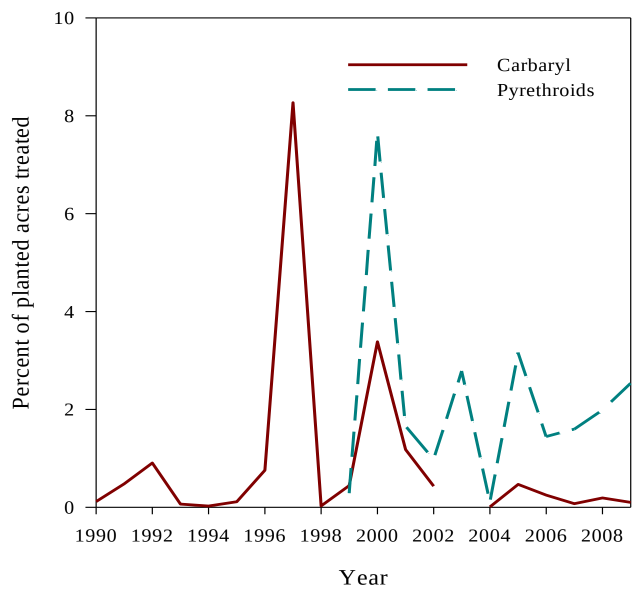

Fig. 1. Percentage of rice acres treated with insecticides registered for armyworm control in selected major rice producing California counties. Only pyrethroid applications made after June 30 of each year were considered as application for armyworm control.

(Following are some observations regarding armyworms that I have made in the UC Rice Blog. To see the color pictures that go with the text, go to http://ucanr.org/blogs/riceblog/, or simply type "UC Rice Blog" in an internet search engine such as Google).

Defoliation caused by armyworms is not uncommon. However, rice plants have abundant foliage and can take quite a bit of defoliation. UC guidelines recommend a treatment only if more than 25% of the foliage has been consumed and you still see armyworms in the field. It can be challenging to find armyworms in a rice field. They usually feed at night. During the heat of the day, they hide at the base of the plants near the water where it's cooler. To monitor for armyworms, open the canopy and look down at the base of the plants at the water level. Spend a minute or two looking, small armyworms can be hard to see. Alternatively, you can shake the plants and observe for worms falling into the water. This is especially effective for large larvae.

Occasionally, panicle damage can be severe. Armyworms can feed on developing panicles causing whole panicles or panicle branches to become blank. Observe closely where the panicle branch breaks or becomes blank and you will see chewing marks. UC guidelines recommend a treatment if more than 10% of the panicles are affected and you still see worms in the field. If you can't find them during the day and are still in doubt, come out during the evening and see if you find any worms in the panicles.

Those fuzzy white cocoons you find at the base of the plants are pupal cases of the parasitic wasp *Apanteles militaris*. The wasp lays its eggs inside the armyworm, wasp larvae develop internally and when they are ready to pupate they exit the armyworm body and form the white cocoons. This, of course, kills the armyworm. It's important to remember that armyworms pupate in the soil. In a rice field, when they are ready to pupate, they usually drop to the water and drown. Some may pupate in the foliage at the water level, but there they are easy prey for their natural enemies. If you see injury but the worms are gone, there is no need to worry about the next generation of armyworms.

Rice Blast –A Bit of a Twist in 2011

Chris Greer, UCCE Sutter-Yuba Counties

The geographic distribution, incidence and severity of rice blast were much greater in 2010 than in recent years and it is starting to look like 2011 will bring more of the same. 2011 has seen leaf blast in the usual areas of Colusa and Glenn Counties but also in some far flung locations. Weather conditions are similar to last season and are obviously permissive for rice blast disease development. The most favorable conditions for sporulation, spore germination and infection of plant tissue by the blast fungus include high relative humidity, free moisture on the plant tissue surface and temperatures around 82^{o} F. Temperatures cooler or warmer than this slow down disease development but do not prohibit it. The conditions we have experienced for most of the summer are fairly conducive…..not too cool at night and not too hot during the day. Free moisture on the plant tissue surface is absolutely essential for the infection process and we have experienced several calm mornings with foggy or overcast skies that favor extended free moisture periods.

As I have mentioned in the past, there are several factors that may predispose rice plants to infection by the rice blast fungus. First and foremost is the inherent resistance of a specific rice variety. Our California rice varieties do differ in their tolerance to infection by the pathogen. M-104 and M-205 appear to be the least tolerant of the most widely grown commercial varieties while M-202 and M-206 are somewhat more tolerant. M-208 is the only commercially available rice variety in California with a specific resistance gene to race IG-1 of the blast pathogen. IG-1 was the only race of this pathogen known to exist in California until recently. Unfortunately, confirmed cases of limited neck blast in 2010 M-208 fields and limited leaf blast in 2011 M-208 fields indicate that a new race of the pathogen has evolved through mutation or has been introduced into California. M-208 is still resistant to race IG-1 but is not resistant to this new race.

I am more convinced than ever that water management plays a critical role in rice blast disease management. Not only does field drainage increase the risk of disease transmission from seed to seedling but any practice which leads to aerobic conditions within the soil predisposes rice plants to rice blast disease. Drill seeding and draining for stand establishment or herbicide applications in water seeded systems increase the risk of infection and plant susceptibility to rice blast. Additionally, rice plants grown in deeper water exhibit increased resistance to the disease over those grown in shallower water depths. This is apparent where we often see localized increased disease severities associated with high spots within a field. From an irrigation standpoint, maintaining a deep continuous flood is the best option for minimizing the risk associated with rice blast disease.

Rice blast is a very complicated disease that has the ability to increase in incidence and severity very rapidly under favorable conditions. Growers should consult with their pest control adviser to determine if a fungicide application(s) should be made to protect developing panicles as they emerge from the boot.

Please give Chris, Luis or Cass a call if you happen to see rice blast in any M-208 field or in any area where rice blast has not been observed in the past.

2011 - About the Same as Last Year

Cass Mutters, UCCE Butte County

The growing season started out cold and rainy, much like 2010. In fact if we use degree day accumulation as a means of comparison, 2011 growing season overall is remarkably similar to 2010 (Tables 1-3). In May 251 and 242 degree days accumulated in Colusa County in 2011 and 2010, respectively (Table 1). Conditions were similar in Sutter and Butte Counties (Table 2 and 3). In contrast, almost twice as many degree days accumulated in May 2009 when compared to this year, 445 compared to 251 in Colusa County. For the months of June, July, and August thus far, the last three years are similar. June and July were actually slightly warmer in 2010 as compared to the other two years. Total degree day accumulation in 2011 and 2010 to date lower than 2009 at the three locations. Interestingly, south Sutter County was warmer than Butte County for two or the last three years. There is a stronger temperature gradient going east west when using degree day accumulation where Colusa County was warmer than both Butte and Sutter Counties. If we assume a daily accumulation of 15 degree day units per day, then the data suggest that the 2011 rice crop is 2-3 days behind 2010 and about 14 days behind 2009.

Table 1. Degree day accumulation by month for 2009 to 2011 in Colusa County (CIMIS station 32, Colusa). 55° and 100º F were used as the lower and upper temperature limits, respectively.

Month	2011	2010	2009
May	251	242	445
June	453	536	489
July	621	618	646
August 1-15	286	249	279
Total	1611	1645	2120

Table 2. Degree day accumulation by month for 2009 to 2011 in Sutter County (CIMIS station 30, Nicolaus). 55° and 100º F were used as the lower and upper temperature limits, respectively.

Month	2011	2010	2009
May	230	228	415
June	434	514	478
July	593	577	603
August 1-15	280	242	270
Total	1537	1561	1766

Table 3. Degree day accumulation by month for 2009 to 2011 in Butte County (CIMIS station 12, Durham). 55° and 100º F were used as the lower and upper temperature limits, respectively.

Month	2011	2010	2009
May	218	219	414
June	428	504	442
July	572	609	594
August 1-15	283	248	267
Total	1501	1580	1717

Planning Harvest

Cass Mutters, UCCE Butte County

If the current temperature trend continues then grain ripening may be prolonged in 2011 as it was in 2010. In 2010, M-205 required 137 days to reach 30% grain moisture and the grain dried at a rate of 0.4 percentage points thereafter in a linear fashion (Figure 2). M-202 and M-206 dried at a similar rate (Table 4). The rate of drying for M-202, M-205 and M-206 was about one-half of the observed rates in 2009 (Table 4). The National Weather Service predicts a slightly cooler to normal August temperatures in the Sacramento Valley (http://www.cpc.ncep.noaa.gov/products/predictions/30day/).

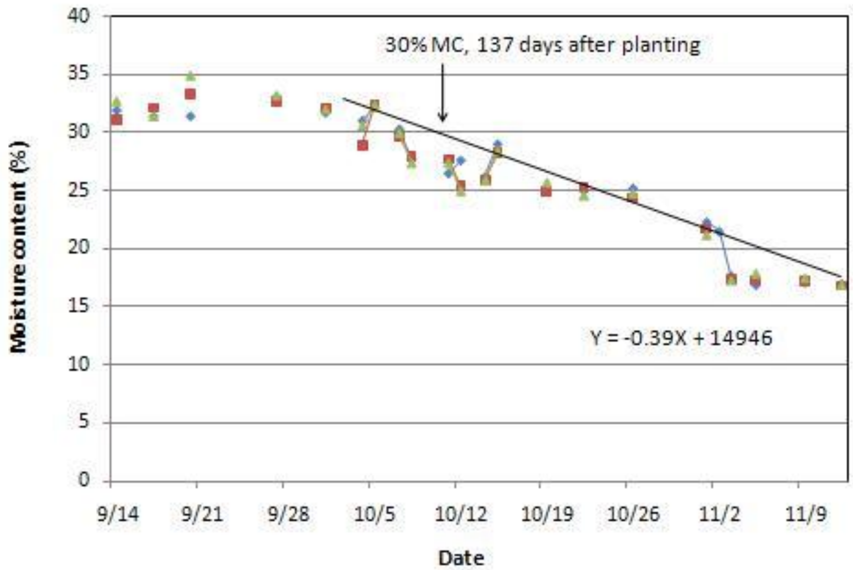

Figure 2. The rate of grain moisture loss from M-205 drained at 28 days after 50% heading in 2010. Planting date: June 1.

Table 4. Daily moisture loss in percentage points from M-202, M-205, and M-206 drained 28 days after 50% heading in 2010.

Variety	**2010**	**2009**
M-202	0.4	0.9
M-205	0.4	0.6
M-206	0.3	0.9
Average	0.37	0.80

Using a Desiccant to Accelerate Dry Down

Cass Mutters, UCCE Butte County

In the event that the rice fails to dry to harvestable moisture content (MC) due to low temperatures and/or rain, it may be necessary to apply a desiccant. Sodium chlorate is a crop desiccant that is registered for use in California rice. This compound has been used only occasionally in California. Consequently, information on its use on California varieties is sparse. Systematic trials conducted in southern rice producing states provide some basic guidelines and reassurance that yield and quality are not affected when sodium chlorate is used at label rates. However it is reported that application when the average kernel moisture was above 25% risked reducing milling quality. This potential injury is associated with the variation in individual grain MC on a plant. For example, at an average MC of 25%, there will be kernels with MC above 27%, the point at which the kernel is physiological mature. Once sodium chlorate is applied these high moisture kernels will stop growing and will not mature. Do not apply sodium chlorate earlier than about 35 to 40 days after heading. The studies also found seed germination unaffected by sodium chlorate, should the need arise to treat a seed field.

Plants treated with sodium chlorate rapidly dry over the course of just a few days. During that period the grain MC can drop as much as 5%. It is advisable to apply it only on the acres that can be harvested within about 5 days after application. When using sodium chlorate, harvest as soon as the kernels reach the desired MC to protect milling quality. This is especially important under California conditions where repeated wetting and drying of low moisture kernels will reduce milling quality. This was the case for Grower A, M-206 where head rice yield was only 51% because the treated rice was not harvested in a timely fashion (Table 5). In the remainder of the observation sites in 2010 (Table 5), the yield and quality for both M-205 and M-206 were unaffected when sodium chlorate treated rice fields were properly managed.

Table 5. Yield and quality of rice treated with sodium chlorate to dry down the rice prior to harvest in 2010. *

Grower	Variety	Treated	Harvest MC	Yield (cwt)	Total rice	Head rice
A	M205	no	25	95	69	65
		yes	21	91	70	65
	M206	no	23	92	70	63
		yes	17	96	69	51
B	M205	no	22	94	73	69
		yes	22	72	74	71
	M206	no	22	94	73	69
		yes	23	90	72	68

* Courtesy of Robert Hornyak

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