UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION
Agriculture & Natural Resources
Rice Briefs

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION COLUSA COUNTY
P. O. Box 180, 100 Sunrise Blvd., Suite E, Colusa, CA 95932—Tel. (530) 458-0570 Fax (530) 458-4625

May 2009

Monitor Early Pests

During the seedling stage, rice plants are susceptible to many pest problems. Arthropods and diseases can reduce stands, which could later translate into problems such as increased weed pressure, lodging, and ultimately, reduced yields.

Midges can greatly affect plant establishment. Adult midges look like mosquitoes but do not bite. They lay their eggs on the water surface once the field is flooded. Larvae hatch in one or two days. They live in the soil surface and can feed in germinating seeds and small seedlings.

Another important pest of the seedling stage is tadpole shrimp. Tadpole shrimp eggs can survive several years in dry fields and hatch once the field is flooded in the spring. This arthropod can feed on germinating seeds and uproot seedlings during foraging in the soil. Their foraging also muddies the water, reducing light penetration and slowing down seedling growth. Crayfish can cause problems similar to tadpole shrimp. Additionally, their tunneling activity can disrupt levees and produce water leaks. This is especially critical during water holding periods after the application of a pesticide.

Check your fields during seedling development. Floating seedlings and muddy water is a good indication of tadpole shrimp activity. If the water is clear, you may see them on the bottom or you may see their shed skins floating in the water. Also, examine injured seedlings for midge larvae and tubes.

Monitor seedling establishment closely 5 to 7 days after seeding. If you find less than 30 healthy seedlings per square foot and signs of midge or tadpole shrimp presence, a management action may be needed. Monitor again a week later. If the stand is below 25 seedlings per square foot and there are sings of midge or tadpole shrimp activity, a management action may be needed.

Currently, no insecticides are registered against midges or crayfish. Copper sulfate can be effective against tadpole shrimp; however, recent studies have shown that copper can bind to straw residue, reducing its efficacy. Cultural practices are a good option to manage these pests. Once seedlings have well established roots they are less susceptible to injury by these pests, therefore, anything that promotes quick seedling establishment will help reduce their impact. Minimizing the time between flooding and seeding is an effective way to prevent the establishment of midges and tadpole shrimp during the period of seedling susceptibility. If crayfish becomes a problem, crop rotation may help reduce their numbers in the field.

Contents

Receive Rice Briefs on your e-mail

To receive this newsletter electronically, go to *http://cecolusa.ucdavis.edu/rice/* , click on “Rice Briefs Newsletter” on the left side menu, enter your e-mail on the next page and click “Submit”. Your e-mail will only be used to deliver the newsletter. If you have any questions, comments, or suggestions regarding topics, contact me at laespino@ucdavis.edu or at 530-458-0578 or 530-635-6234.

Herbicide Programs For Resistant Late Watergrass

Luis Espino, UCCE, and Albert Fischer, UC Davis

Late watergrass, *Echinochloa phyllopogon* is one of the most difficult weeds to control in California rice fields. In many areas this weed has evolved resistance to most available rice herbicides; this resistant form of late watergrass is also called “mimic”. Studies have confirmed resistance to Granite (penoxsulam), Regiment (bispyribac-sodium), Whip (fenoxaprop-p-ethyl), Clincher (cyhalofop-butyl), Bolero/Abolish (thiobencarb), and Cerano (clomazone).

Several combinations of herbicides were evaluated during 2008 by the UC Davis Weed Science Program to try to control resistant late watergrass. Small plots were established in a field with a severe resistant late watergrass infestation in Glenn County. Treatments consisted of day of seeding, into the water application of Cerano or Granite GR, followed by a foliar spray of a different herbicide at the 4-5 leaf stage of rice with the water lowered for foliar exposure.

Results show that various herbicide combinations can achieve acceptable resistant late watergrass control and rice yields (Figs. 1-3). For example,

(Continued on next page)

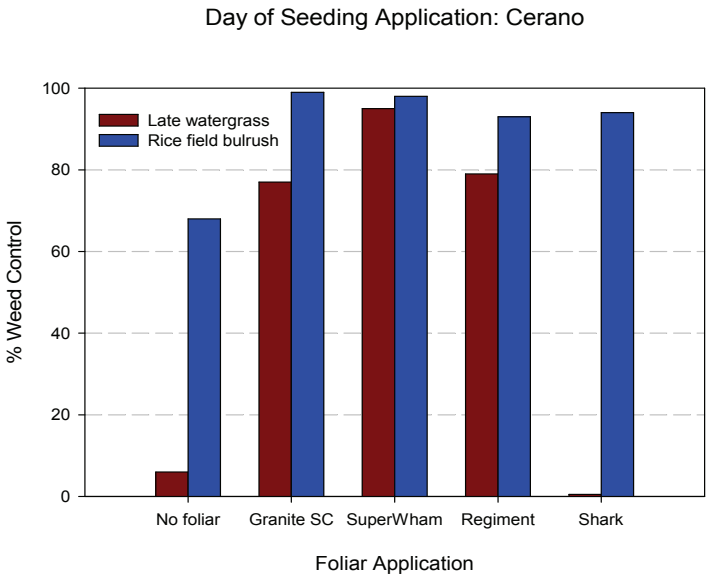

Fig. 1. Percent weed control 97 days after seeding. Cerano applied at day of seeding followed by foliar applications made at the 4-5 leaf stage of rice. Glenn Co., 2008.

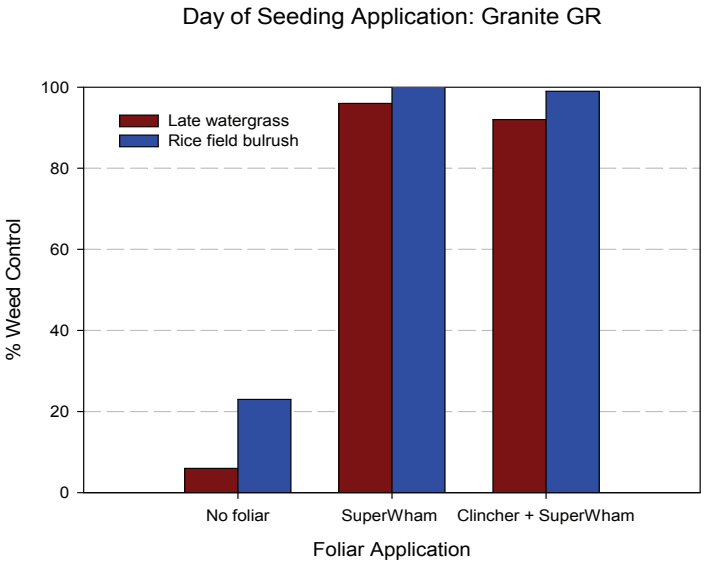

Fig. 2. Percent weed control 97 days after seeding. Granite GR applied at day of seeding followed by foliar applications made at the 4-5 leaf stage of rice. Glenn Co., 2008.

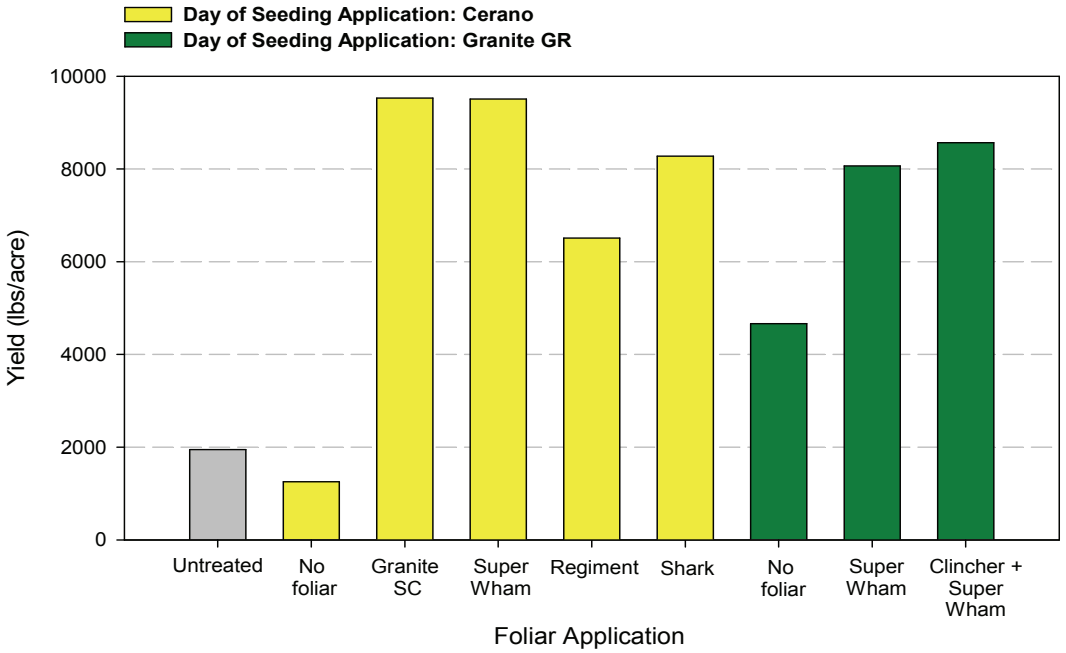

Fig. 3. Yield from plots infested with resistant watergrass and treated with selected herbicides. Cerano or Granite GR applied at day of seeding followed by foliar applications made at the 4-5 leaf stage of rice. Glenn Co., 2008.

Measuring Salinity Of Irrigation Water

One common measure of water salinity is electrical conductivity (EC). Basically, EC measures the capacity of a solution to transfer an electrical current between two electrodes. Water with a high concentration of salts is a good medium for electricity movement and will have a higher EC than water with a low salt concentration.

Laboratory water analyses will measure EC and provide other information to help assess the quality of a water source. However, it is not feasible to conduct these analyses every year. EC can also be monitored in the field using a handheld EC meter. The most common portable EC meters are the stick type, which consist of a small metal probe attached to a digital display. These EC meters are very useful in that they are easy to use, small, relatively inexpensive, and provide measurements with a reasonable level of accuracy. To ensure correct readings, verify the units and calibrate the device before use.

Units: There are several units used to measure EC. The most common is deciSiemens per meter (dS/m). Other units and their corresponding equivalence to dS/m are presented in the table below. When using your EC meter, make sure you know what units are being displayed. This information can be found in the manual or can be inferred during the calibration process (by using a solution of known conductivity).

Calibration: Handheld EC meters require calibration prior to use. This is usually done with solutions of known conductivity provided by the manufacturer. The device manual should contain instructions for correct calibration. Calibrate your EC meter as often as possible, at least once before the season starts. Calibration should be made considering that, for agricultural purposes, EC readings will range from 0.5 to 4 dS/m. Very low or very high values are not common in agriculture (for example, the EC of distilled water, water without any salts, is approximately 0.002 dS/m, and the EC of sea water is 58 dS/m).

Unit	Symbol	Equivalence to dS/m
microSiemens per centimeter	μS/cm	1 dS/m = 1000 μS/cm
milliSiemens per centimeter	mS/cm	1 dS/m = 1 mS/cm
millimho per centimeter	mmho/cm or $m\Omega^{-1}$/cm or m ℧/cm	1 dS/m = 1 mmho/cm
parts per million	ppm	1 dS/m = 640 ppm
milligrams per liter	mg/l	1 dS/m = 640 mg/l

Rice is most susceptible to salt damage during the seedling and pollination stages. Sacramento river water is low in salts, with EC ranging from 0.13 to 0.37 dS/m. However, drain and well water can have much higher salinity content. Also, water management can affect salinity of water in rice fields.

Yield reductions have been observed when the EC of irrigation water was higher than 1.9 dS/m. Typically, water in lower basins has higher salinity, and EC values tend to peak during holding periods. Reducing salinity levels can be achieved by adding fresh water (or water with a lower EC value) to fields with salty water. Continued water flow will not let salts accumulate in the field. Water holding requirements may render continued flow difficult. If using saline water, avoid using herbicides that require long term water holding periods.

Herbicides Programs *(Continued from previous page)*

Cerano followed by SuperWham (propanil) gave very good watergrass control and rice grain yield. Similarly, Granite GR followed by Clincher and/or SuperWham worked very well. Using Cerano or Granite GR alone did not control resistant late watergrass satisfactorily.

When choosing an herbicide mix for resistant late watergrass control, consider other weeds that may be present. In the study mentioned above, rice field bulrush was satisfactorily controlled with all herbicide mixes.

Rates used in the experiments:
Cerano: 12 lb/a
Granite SC: 2.4 oz/a
SuperWham: 6 qt/a
Regiment: 0.79 oz/a
Shark: 4 oz/a
Granite GR: 15 lb/a
Clincher: 15 oz/a

This newsletter is produced by:

Luis Espino

Farm Advisor

P.O. Box 180
100 Sunrise Blvd., Suite E
Colusa, CA 95932
(530) 458-0570
(530) 635-6234
Email: laespino@ucdavis.edu
http://cecolusa.ucdavis.edu/rice/

COOPERATIVE EXTENSION
University of California
P.O. Box 180
Colusa, CA 95932

Non-Profit Org.
U.S. POSTAGE
P A I D
Colusa, CA
95932
Permit No. 3

Rice Briefs