HEALTHY FOOD SYSTEMS | HEALTHY ENVIRONMENTS | HEALTHY COMMUNITIES | HEALTHY CALIFORNIANS

Rice Leaf Newsletter

November 2023

UC CE University of California Agriculture and Natural Resources Cooperative Extension Butte County

2024 UCCE Rice Meetings

Save the Date

Richvale – January 9, 8 am – 12 pm

Willows – January 9, 1 – 5 pm

Colusa – January 10, 8 am – 12 pm

Yuba City – January 10, 1 – 5 pm

Woodland – January 11, 8 am – 12 pm

Contents November 2023

Testing no-till dril-seeded rice

Bruce Linquist, UCCE Rice Specialist

I wrote in a previous Newsletter article about some new research we are doing ting testing no-till (NT) drill seeded rice production. Why are we doing this? It is one way to save considerable amounts of irrigation water. We estimate that up to 0.5 ac ft/ac of water could be saved. Water savings are due to using existing soil moisture (from the winter/spring rains) and limiting the evaporation of water during the first month of the season by not having the field flooded. Other potential benefits include reduced tillage costs, the ability to plant early, and avoiding tadpole shrimp and seed midge injury. If rotating with water-seeded systems, it is also a great way to use different modes of action to address herbicide resistant weed issues.

Briefly, to recap. This study was conducted at the Rice Experiment Station and was run by Mia Godbey (graduate student) and Ray Stogsdill, with Luis and

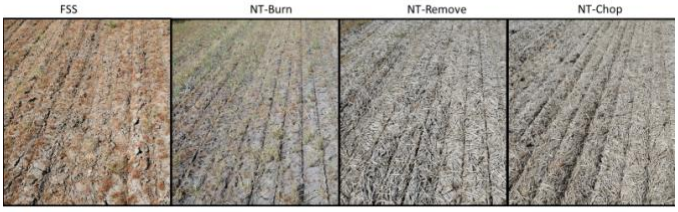
Whitney looking at pests and weeds. We tested NT drill seeding into four different seedbeds.

1. Fallow stale-seedbed (FSS): field was fallowed in 2022. It was disked and leveled then. It was not flooded during the winter. No tillage was done in 2023.
2. No-till. We have three strict NT treatments. Rice was grown in 2022. After harvesting (harvested to limit ruts), the straw in the field was subjected to one of three treatments:
    a. Chopped (NT-Chop)
    b. Half removed to simulate baling (NT-Remove)
    c. Burned (NT-Burn)

    The no-till fields were all winter flooded.

At time of planting, there were a lot of winter weeds in the NT-Burn and FSS treatments (with the wet spring we got more winter weeds than normal). While we tried to get rid of them by spraying glyphosate before drilling, many were tolerant. In the NT-Chop and NT-Remove treatments there were little to no weeds. On May 2 the fields were all planted with a Great Plains no-till drill seeder (see above) at a rate of 150 lb seed/ac. After seeding, all treatments received an initial irrigation flush on May 4 and the flush was drained on May 8. We did not apply any herbicide at planting before or after the flush.

Treatments after planting (May 2)

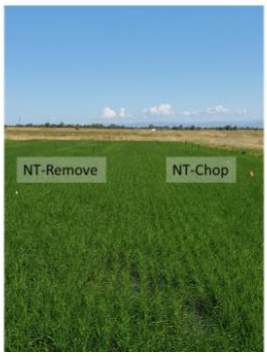


We chose this year to have the same planting date for all treatments, but the FSS and NT-Burn treatments could have been planted in mid-April. However, the treatments with straw on the surface had too much soil moisture to be able to get equipment into the field and May 2 was the earliest we could get into these fields.

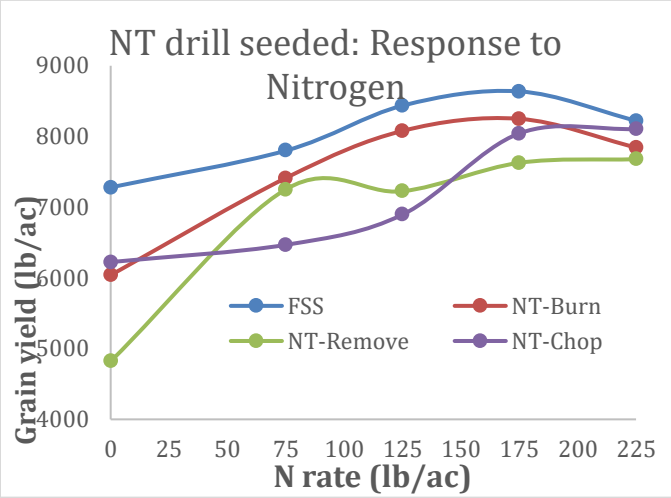
We did not apply any irrigation water after the initial flush at planting until June 2 when we applied the permanent flood. The rice was at the 4-leaf stage by this time. We got a good stand in all treatments. The stand was lowest in the NT-Chop treatment but still good. The soil moisture in the NT-Burn and FSS was starting to dry out but we did not see any moisture stress. In the NT-Chop treatment, there was still a lot of moisture beneath the straw mat. The winter weeds were still present but we saw very few other weeds coming up. Just before permanent flood, we applied urea and herbicides (Prowl, Clincher and Propanil).

After the permanent flood, the plants almost doubled in height in the first few days and were well above the water line. The winter weeds persisted into the permanent flood. However, they did not appear to affect the stand of rice.

June 20



These plots were harvested with a small plot combine on September 28. Grain yields responded to various rates of N application. Yields were highest (8640 lb/ac) in rice after fallow (FSS) followed by NT-Burn and then the NT-Remove and NT-Chopped. Yields in all treatments were highest at the 175 lb N/ac N rate. While these yields were no super high, they were comparable to the maximum yields we observed in water-seeded conventional rice at the RES which was 8490 lb/ac.



We are very encouraged by these results and will be providing greater detail in our upcoming winter grower meetings. In future years we will be looking at optimizing herbicide and fertility practices as well as quantifying water savings.

2023 Seed production report

Timothy Blank, California Crop Improvement Association

Certified seed production returned to normal levels in 2023. The CA Crop Improvement Assn. passed 27,818 acres for seed. Field inspections were initiated in early August and the last inspections took place in early October.

107 acres (1 field) were rejected due to presence of weedy red rice, and those rejected acres were within the Quality Assurance program that oversees specialty varieties that are not eligible for certification. Included in the total acres passed for seed production are 1297 acres approved within the Quality Assurance program, of which 978 seed acres were Koshihikari production.

M-206 remains the variety with the most acres of seed production, followed by M-211, M-209, M-105, and M-210. Looking at all seed production by grain size, 87% of the approved production was medium grain varieties, 11% short grain varieties, and 2% long grain varieties.

Weeds to watch out for: 2023 edition

Whitney Brim-DeForest, Rice Farming Systems Advisor, UCCE

"White Water Fire" (*Bergia capensis*)

From Butte County Agricultural Commissioner's office: A weed sample collected in Butte County on September 19, 2023 was submitted to the California Department of Food and Agriculture (CDFA) botany lab for identification. The sample was identified as "White Water Fire" (*Bergia capensis*). Notes from the CDFA lab indicated that this is the first record of the plant in California and possibly the USA. CDFA has assigned a temporary Q rating, pending California pest rating proposal and public comment period to establish a permanent rating.

The sample was collected from a rice field and was found growing inside the field. It was not growing on banks or in ditches, it appears the preferable habitat is rice fields and marshy areas. It looks similar to; redstem (*Ammania* spp.) but the stem itself is much larger in diameter and less dense. Currently, there is little information globally on the plant; how invasive it is and how it impacts rice fields. The plant is native to Africa and China, and has been identified in parts of Central America.

Since the initial identification, the Butte County Department of Agriculture has surveyed additional

rice fields and did not find it in any other locations. One of the common ways of spread is the cultivation of rice. As of this date it has only been found in three checks of one rice site.

As with all noxious weed species, in commercial agricultural settings it is important to follow best management practices, this may include roguing field of species prior to harvest and cleaning/sanitizing of equipment post-harvest.

As more information is gained from partners at CDFA, the County Agricultural Commissioner's office will disseminate information to all interested parties.

From UCCE: Kassim Al-Khatib is currently working on developing information for herbicide control of this weed (using currently registered rice herbicides). An update will be forthcoming at the winter grower meetings. Stay tuned!

Winged Primrose Willow (*Ludwigia decurrens*)

Winged primrose willow (WPW) is rated a Category A pest by the California Department of Food and Agriculture (CDFA), meaning that it is subject to enforcement action if found in a field. Its presence in a seed field also disqualifies that field from seed production. It was first found in Butte County rice fields in 2011. Since then, it is not known to have spread into other counties, but it is still found along major irrigation canals and thus has the potential to move.

It starts flowering in July or August, so the big, yellow flowers should be easy to spot if you have it in your field. It tends to grow in drained areas, or along field margins (levees, irrigation ditches, etc.) The seed pods, roots, and stems can float, so until it is eradicated, there is a chance that it could end up in other areas outside of Butte County. It propagates by seed, but parts of stems or roots can re-grow into plants.

Herbicide applications are effective when the weed is small, but will not be effective as the plants grow taller (more than 1 foot tall).

Effective herbicide applications are:

1. Early water active herbicides:
    a. Bolero Ultramax
    b. Cerano
    c. Granite GR
2. Follow-up foliar
    a. Early: Sandea, Londax
    b. Late: Grandstand or Grandstand/ Propanil mix

The only means of dealing with it when it is large is by pulling it out and disposing of it. Disposal should be into a trash can, not on field edges.

To distinguish from common primrose, the WPW has 4 petals (see above photo) and the common primrose has 5 petals. Both are yellow in color. The winged primrose stem has wings on the stem (see below) in cross-section.

As always, please be on the lookout for unusual weeds, and report them to your local Farm Advisor (Michelle Leinfelder-Miles in San Joaquin, Luis Espino in Butte or Glenn, or Whitney Brim-DeForest in Sutter, Yuba, Placer or Sacramento).

Diseases in 2023

Luis Espino, UCCE Farm Advisor

This year we saw severe blast in some areas of the Valley. I did not see any leaf blast during tillering and only noticed blast during heading. After talking with some growers and PCAs, it seems that this was common in several areas. I also saw and got reports of severe blast in drill or dry seeded rice. In these cases, the blast was so severe that even fungicide applications were not able to reduce the blast incidence significatively. Kernel smut was also an issue in some fields, but it did not seem to be as bad an issue as blast was. Tiller diseases were average, but I seemed to notice more aggregate sheath spot this year than previously.

Why was blast more prevalent this year? Several factors can increase the incidence of blast, but two that come to mind are excess nitrogen and relative humidity. With many fields being fallowed last year, there might have been more nitrogen in the soil available for the plant. If the rate of aqua N was not reduced, the field may have ended up with some excess nitrogen that could have made blast a problem.

Compared to 2022, 2023 had higher relative humidity during the season (fig. 1). According to the Williams CIMIS weather station, the average maximum relative humidity for the month of July for 2022 and 2023 was 77 and 96%, respectively, while the minimums were 19 and 44%. Higher relative humidity, combined with lower wind speeds during the months of July and August probably, may have resulted in longer periods of free moisture on plant surfaces during mornings, which allows for germination of blast spores and infection of leaves and panicles.

Why do we see more severe blast when dry or drill-seeding? It is not clear why, but it may have to do with how blast is transmitted from residue or seed to seedling. There might be also some physiological changes in the plants that make them more susceptible.

The only blast resistant variety commercially available at this point is M-210. I did not see any blast or got any reports of blast in M-210. In areas where blast is a common occurrence, and when dry or drill-seeding, I would recommend using M-210. Variety trials from previous years have shown that M-210 yields the same as M-206. I will compare M-

206 and M-210 yields from this year's variety trials and present them during our winter meetings.

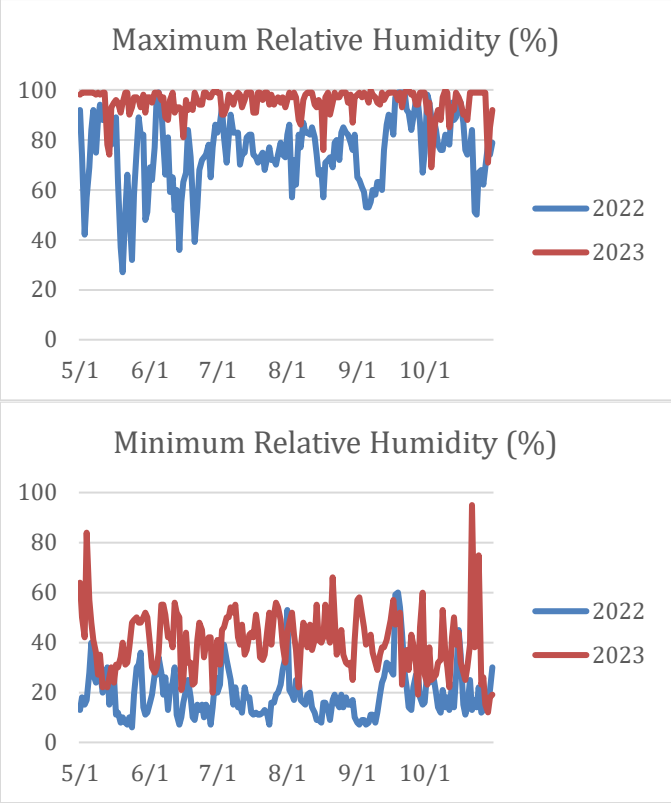


Fig. 1. Maximum and minimum percent relative humidity for 2022 and 2023 at the Williams CIMIS station.

Another common question I get is if azoxystrobin (the active ingredient in Quadris) is still effective against blast. I was able to set up a trail in a field in Glenn County and results showed that the most commonly used rate of Quadris (12.5 oz/a) was effective against blast (fig. 2). There could be some differences in susceptibility to the fungicide in different areas, so more trials are needed to answer this question thoroughly.

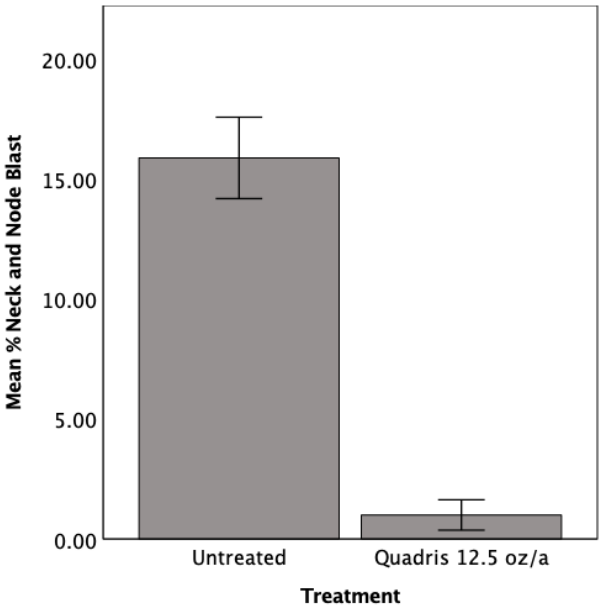


Fig. 2. Percent neck or node blast in M-206 treated with Quadris. Treatment was made at the late boot, early heading stage. Glenn County, 2023.

2023 Delta Recap

Michele Leinfelder-Miles, Delta and Agronomic Crops Advisor

Rice production in the Sacramento-San Joaquin Delta region has been steadily increasing in recent years (Table 1). While Delta acreage is only a fraction of that in the Sacramento Valley, Delta yields are consistent with statewide averages. I estimate that in 2023, the Delta had around 10,000 acres of rice. In this seasonal recap, I'll overview UCCE research in Delta rice, as well as provide some observations about the 2023 season.

Herbicide Trial

Over the last several years, we have conducted trials to evaluate the efficacy of a new herbicide product, Loyant (florpyrauxifen-benzyl; Corteva Agriscience), on grasses and sedges in the Delta drill-seeded system. Loyant is now registered and was available for the 2023 season. Over the last two years, I have been working with Deniz Inci (UC Davis graduate student) and Kassim Al-Khatib (UC Extension Specialist) to evaluate Loyant for efficacy on cattails. In the the Delta's drill-seeded system, cattails may emerge ahead of the rice crop and outcompete the rice. In both years, we found that the label rate of Loyant had efficacy on cattails that were less than three feet tall (Fig. 1). When treated by that size, we were later able to pull up dessicated plants, including the rhizomes. Growers will need to be cautious of drift issues, however,

because pistachio and grape are highly-susceptible to drift damage by Loyant, with almond, walnut, and peach being only minorly damaged, if at all.

Table 1. Rice acreage and yield.

California Rice Production						
	2022	2021	2020	2019	2018	2017
SJC* Acreage	8930	7070	4990	4360	3620	3060
Proportion of statewide acreage in the Delta	N/A	2%	1%	0.9%	0.7%	0.7%
Average SJC* Yield (cwt/ac)	101	95	88	81	86	82
Average Statewide Yield (cwt/ac)	N/A	91	87	85	97	84

**Rice acreage and yield according to the San Joaquin County (SJC) Agricultural Commissioner's Crop Reports. Rice acreage in SJC is primarily in the Delta region. Delta acreage in other counties is not included in these statistics. At the time of publishing, 2022 CDFA statewide data were not yet available (N/A).*

Figure 1. The herbicide, Loyant, was trialed on cattails in the Delta in 2022 and 2023. We observed good control when cattails were less than 3 feet tall.

Armyworm Monitoring

I have been monitoring armyworm populations in the Delta since 2016, in collaboration with my UCCE colleague, Luis Espino. Monitoring involves scouting for damage and deployment of pheromone bucket traps that catch the moths. We can use trap counts and Growing Degree Day modelling (i.e. a temperature measure of time) to determine whether and when to treat fields. In 2023, we were thinking we might get away with minimal pressure because the population stayed low through early July. Then, the population spiked in mid-July, later than we had ever observed (Fig. 2). We surmise this was due to the cool, wet spring and later planting season. This year, Methoxyfenozide (Intrepid 2F) was available for use under full registration.

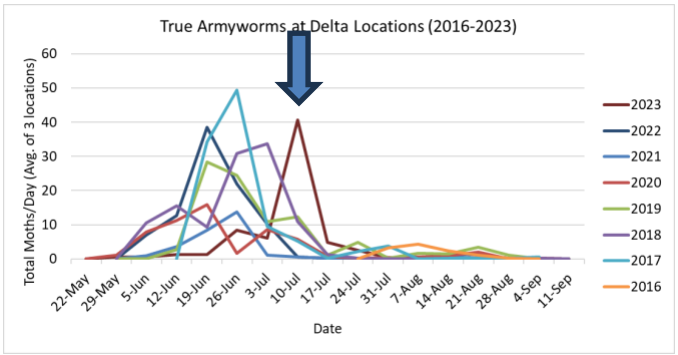


Figure 2. Delta true armyworm trap counts, 2016-2023. In 2023, the population was late to peak, likely due to the cool, wet spring and late planting season.

Disease Observations

We have identified diseases like stem rot, aggregate sheath spot, and rice blast on some Delta farms. It is important to scout for these diseases at late-tillering and early-heading because treatment timing is critical for management. Fungicide treatments are most effective when applied at early-heading. Rice blast may be exacerbated by too much nitrogen, and stem rot and aggregate sheath spot by low potassium (K). K can be limiting in some Delta soils, especially where the straw is baled. There is a loss of approximately 28 lb K/ac for every ton of straw removed. Consider leaf tissue sampling for K between tillering and panicle initiation. The Y-leaf should have a K concentration of at least 1.5%. At heading, the flag leaf should have a K concentration of at least 1.2%. On-farm consultations are a service provided by UCCE. Please reach out if I can help identify pests and provide management guidelines.

Weedy Rice

We should continue to keep weedy rice on our radars because we have observed it in the Delta. In-season management includes rogueing or spot spraying before viable seed is produced. The organic herbicide Suppress is registered for spot spraying. Post-harvest management should include straw chopping but ***not*** incorporation and winter flooding. This will keep seed on the soil surface, where it can potentially deteriorate over the winter.

Variety Trial

UCCE collaborates with the California Rice Experiment Station to evaluate commercial varieties and advanced breeding lines. The San Joaquin County Delta location was one of ten locations in the 2023 statewide trial. The Delta is a test site for very-early maturing varieties because it has cooler growing conditions than other rice growing regions of the state. Variety trial results will be made available in the February 2024 newsletter.

Cover Cropping

With funding from the CDFA Healthy Soils Program and CA Rice Research Board, I am collaborating with Sara Rosenburg (UC Davis graduate student) and Whitney Brim-DeForest (UCCE rice advisor) to evaluate winter cover crops. We are interested to learn whether cover cropping improves soil carbon and nitrogen dynamics in the rice system. Since rice may be grown over multiple seasons without rotation, cover crops may provide an opportunity to introduce plant diversity, including nitrogen-fixing legumes. Trials will occur from 2022-2025, and the Delta site is one of three (also in Butte and Colusa counties). The 2022-2023 winter season presented several challenges for cover cropping. At the Delta location, seasonal rainfall exceeded 25 inches, and in the ten days after planting, the site received nearly 3.5 inches of rain. In addition to saturated soils, bird predation was severe. This fall, our aim is to plant earlier, if conditions allow.

Thank you to all the growers who collaborated with us on these projects. I wish everyone a good end to the year and a great 2024.