Weedy Rice Historical Overview and Ongoing Survey Efforts

August 2025

Luis Espino
Whitney Brim-DeForest
Michelle Leinfelder-Miles
University of California Cooperative Extension

Historical Background

- Problem in all rice producing areas of the world
- First reported in the southern US in 1846
- By 1898, rice fields in Louisiana had to be abandoned

Historical Background

- 1917: first reference of weedy rice in CA
- 1930s: weedy rice present in seed
  - 31-42% of seed samples from CA contained red rice (3-57 seeds/lb)

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IMPROVING RICE SEED

BY W. W. MACKIE

OCTOBER, 1917

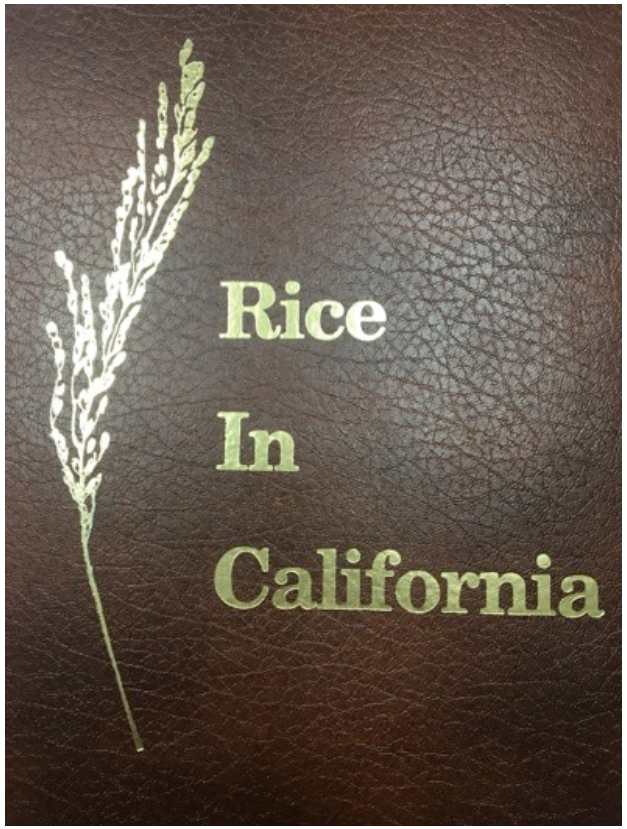
Only the best and purest rice seed should be planted because such seed produces the best plants, the largest yields, and the earliest maturity. The planting of impure seed has spread many pests. The most injurious rice seed pests in California are water-grass, red rice, and rogue rices. Other weed seeds do not appear to be serious or they can be removed by proper recleaning of the seed.

Water-grass is the most serious pest to the California rice farmer. In July when the rice fields are in flood, the water-grass may be detected by its more compact or bunchy habit of growth and the darker color of its leaves. The veins of the leaves are not all parallel as in rice, but contain cross veins. Water-grass matures earlier than rice and its large, heavy bearded heads can be readily distinguished. The mature seed is about the size of No. 6 shot and is covered with a smooth, glistening coat to which is attached a barbed beard. This barbed beard serves to attach the seed to grain sacks. Old or refilled rice sacks therefore should not be used for rice seed. Water-grass seed, being very heavy, cannot be completely cleaned out of the rice seed even by good re-cleaning machinery. Hence it is imperative, if clean seed is to be secured, that no water-grass seed should be harvested, even though the field must be hand pulled many times even to the day of harvest.

Red rice is a different species of rice from the commercial varieties. It can be detected by its habit of dense bunching due to profuse tillering. This plant is usually earlier, darker in color, shorter and more spreading than the varieties of rice grown commercially in California. The heads are bearded, dark in color and ripen irregularly. Many blasted or infertile florets are usual. As soon as the kernels become hard they begin to drop to the ground, where they remain uninjured by the water or winter rains until spring, when a large number volunteer at the time of rice planting. One red rice seed may produce several thousand seeds. When these appear in the milled rice they give the product a dirty, unattractive appearance which discounts the price. To test for red rice seed in threshed or rough rice, rub a

Historical Background

- 1950s: certified seed widely adopted



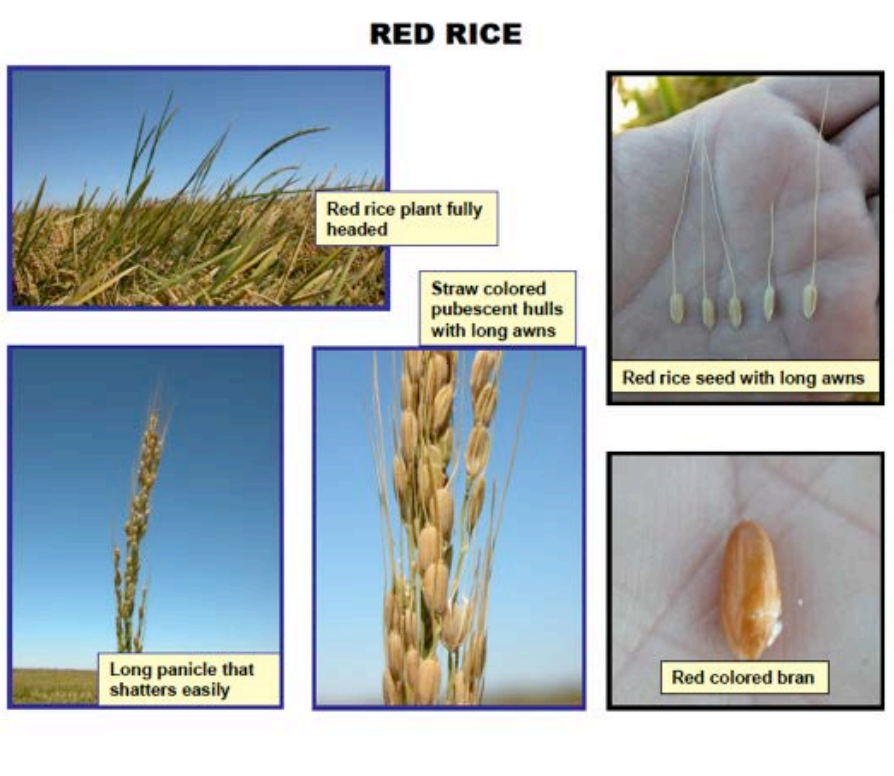
- 1950s-2000s: rare, but still present

SEAMAN (comment): There is no red rice problem in California. I have difficulty in finding a specimen of red rice for my weed collection. From 1920 to 1940, there was a tremendous build-up of the percentage of seed lots from all over the state that were severely contaminated with red rice. Now, there is no problem. I attribute this to our continuous flooded rice culture and the use of molinate and other herbicides.

1980: Weed Control in Rice Conference, IRRI

Historical Background

- 2003 – Glenn County
- 2006 - six fiends in Glenn and Colusa counties
  - Only one weedy rice type identified
- 2007-2015: A few isolated finds, new types




Solitary red rice plant at mid-season

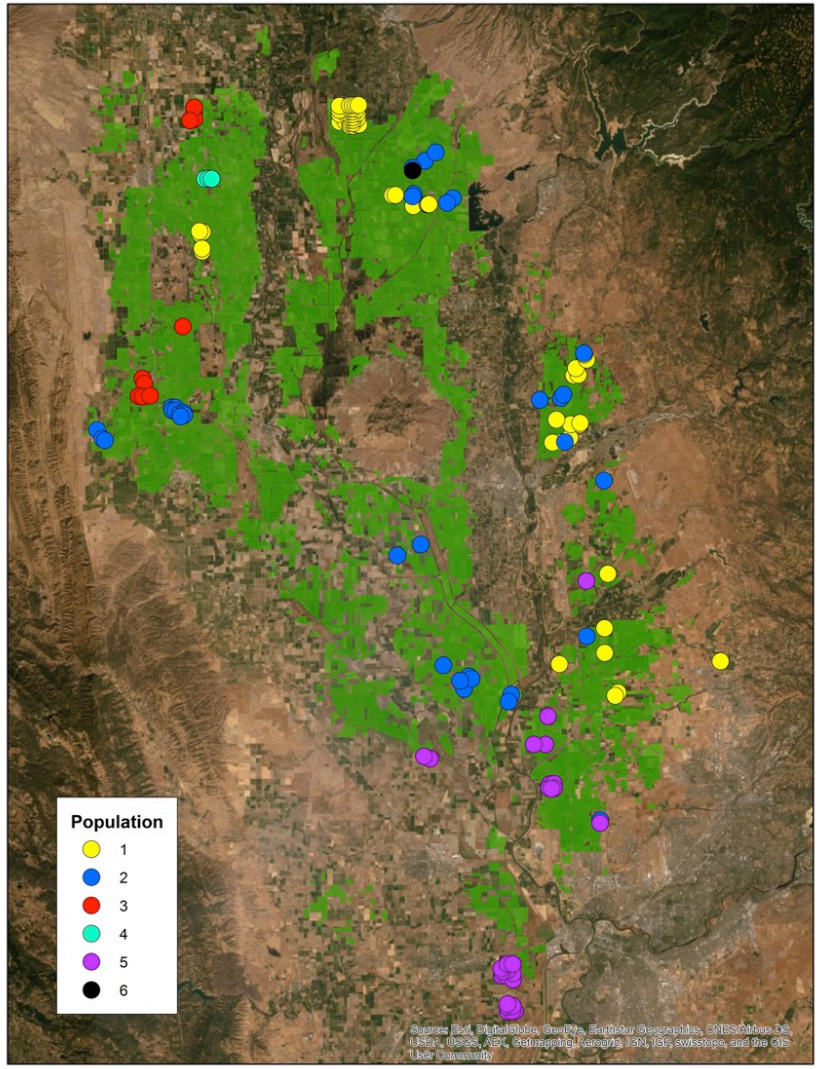

Red rice leaf collars


Patch of red rice next to levee prior to heading


Red rice ligule & auricles

Current Situation and Distribution

- 2016: Several fields found infested in all counties, 5 different types
- 2018: Aprox 14,000 infested acres, 6 types
- 2019: certified seed use requirement
- 2020-2021: field survey
  - Inspected acres: 13K
  - Infested basins: 3,412



Weedy rice 2019


Type 1


Type 2

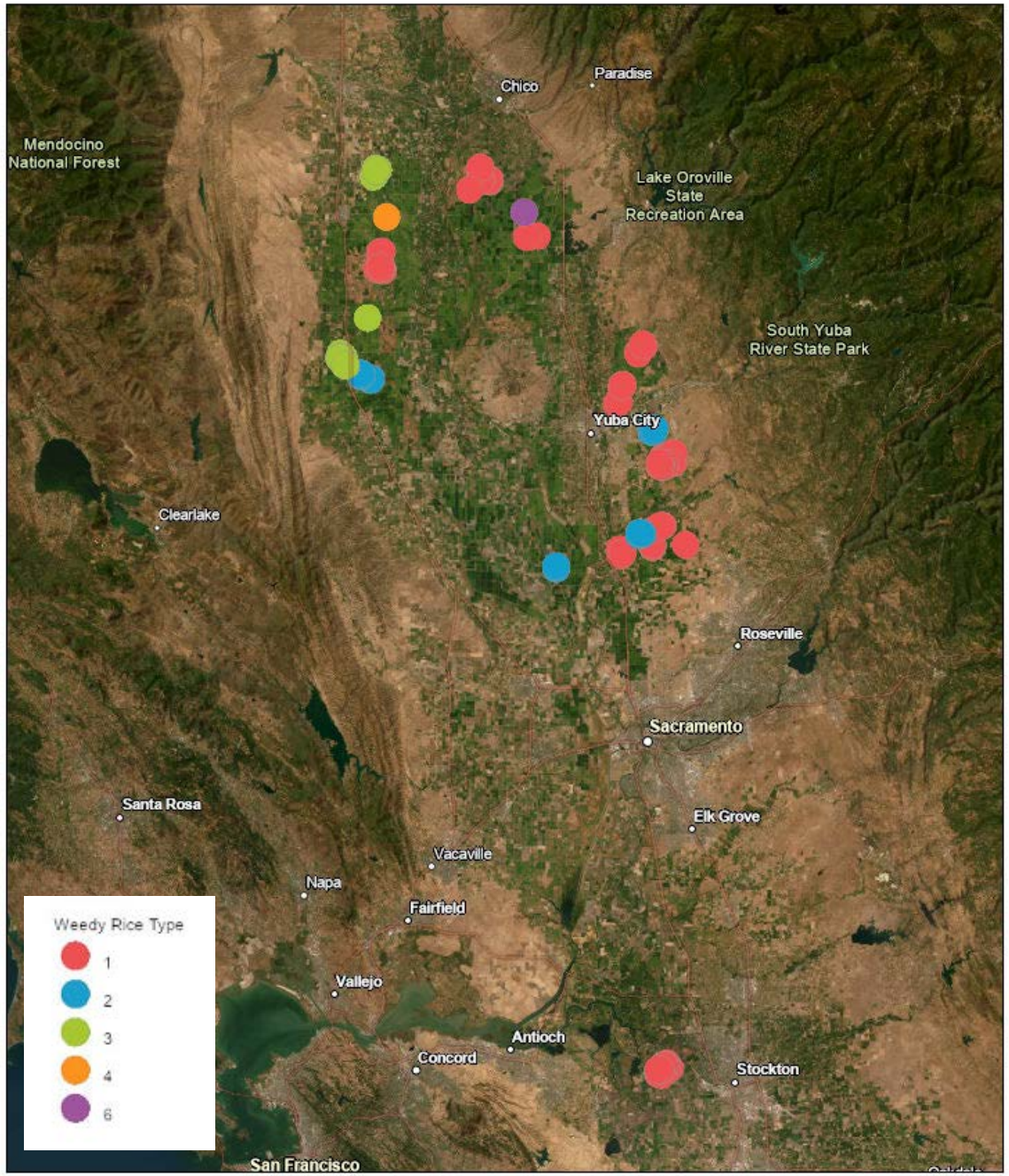

Type 3


Type 4

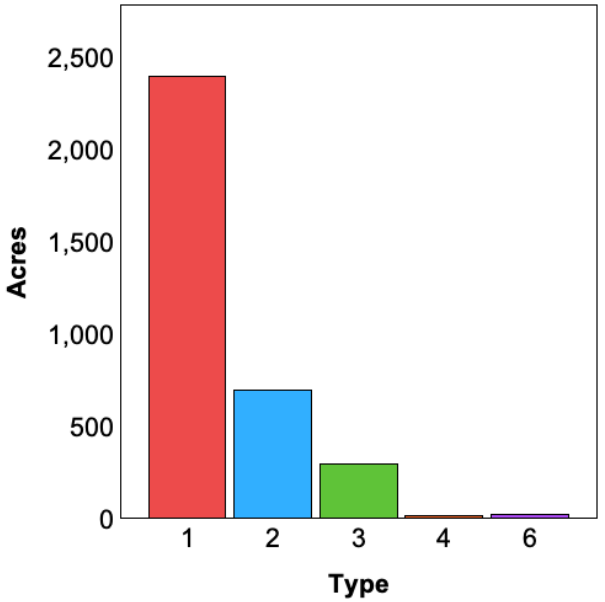

Type 5


Type 6

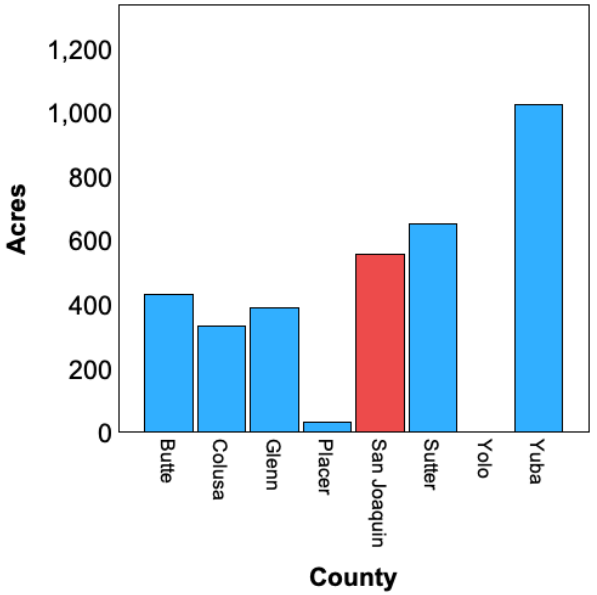
Weedy Rice March 2022



Weedy rice acres by type, 2022



Weedy rice acres by county, 2022



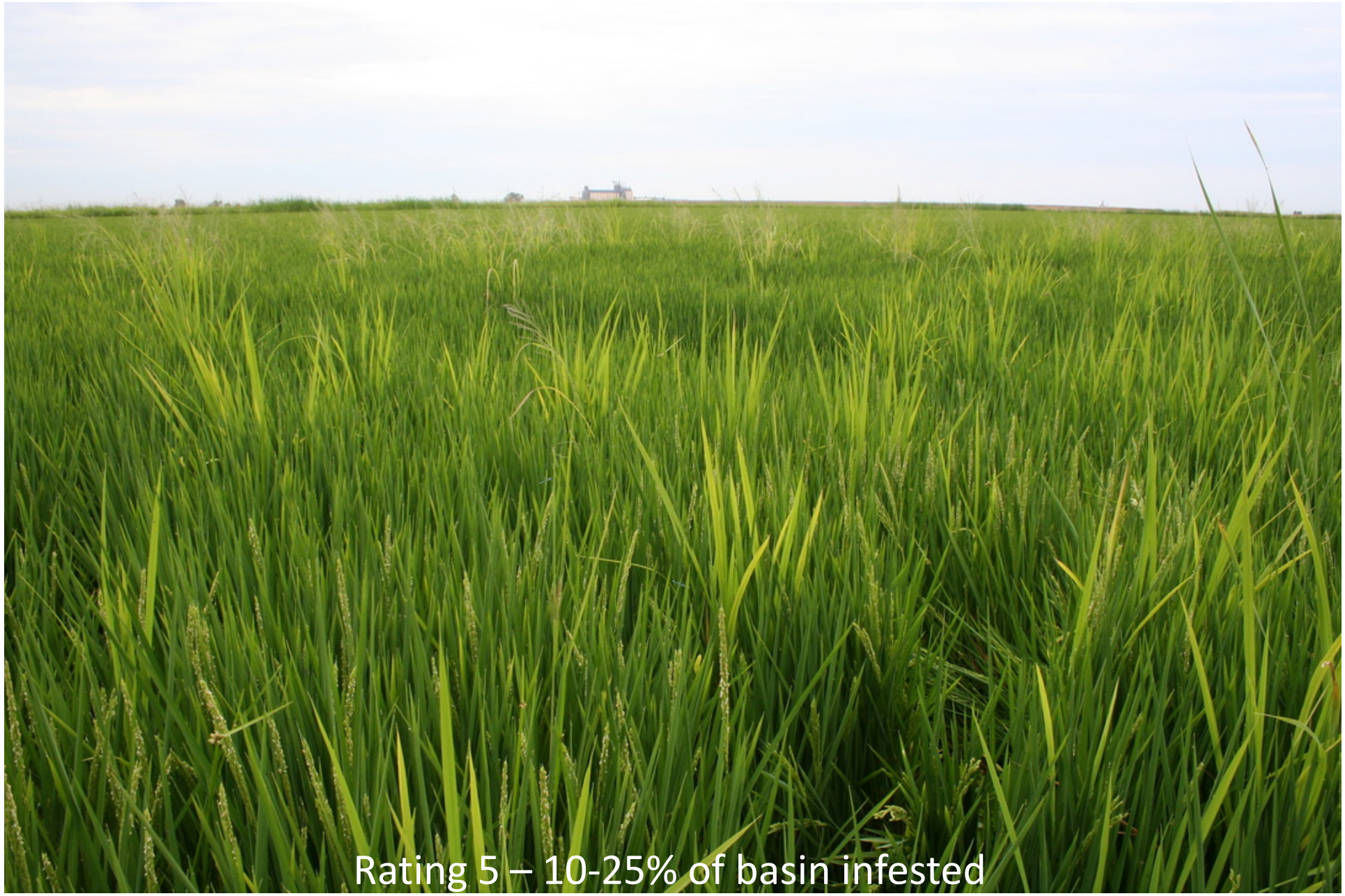
Weedy Rice Infestation Rating

Rating	Description
0	No weedy rice found/ fallow or rotated to different crop
1	Less than ten individual plants and no plant patches
2	More than ten individual plants and no plant patches
3	Less than five patches of plants
4	More than five patches
5	10%-25% of basin infested
6	25% or more of basin infested

Rating 1 – less than 10 individual plants and no patches

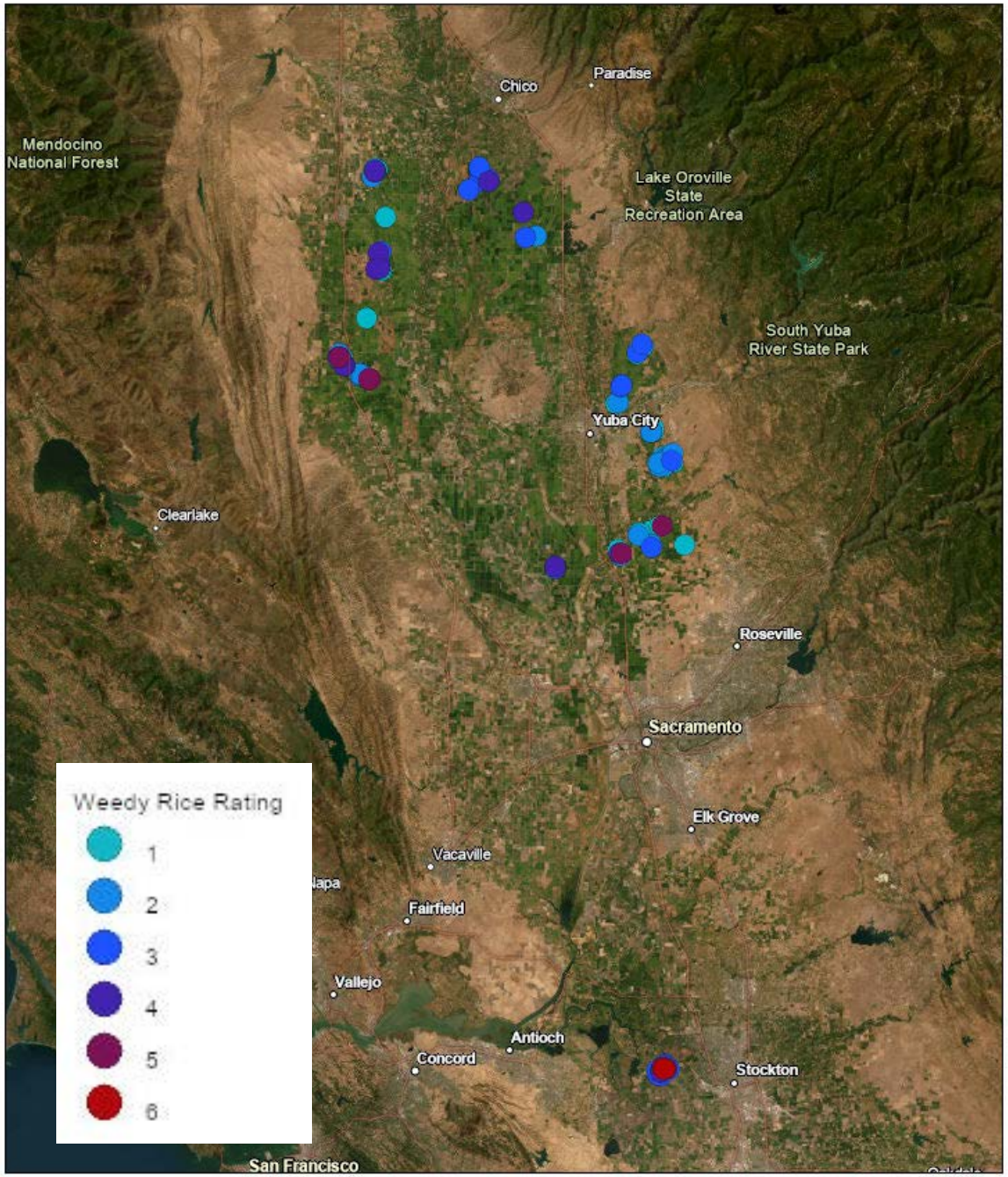

Rating 2 – more than 10 individual plants and no patches

Rating 3 – Less than five patches
Rating 4 – More than five patches

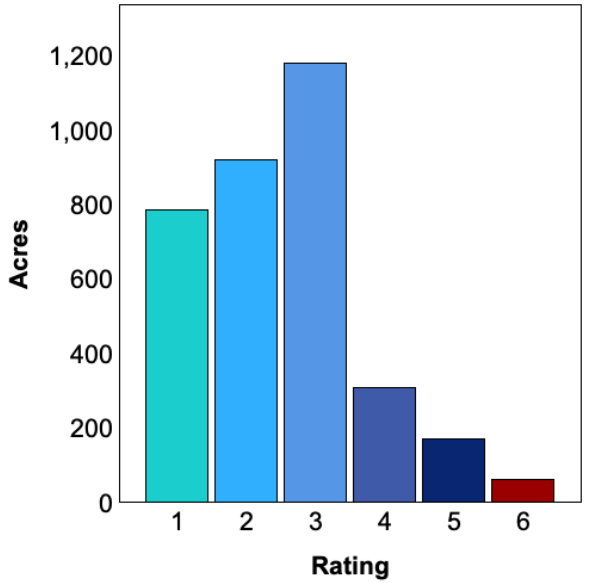

Rating 5 – 10-25% of basin infested


Rating 6 – more than 25% of basin infested

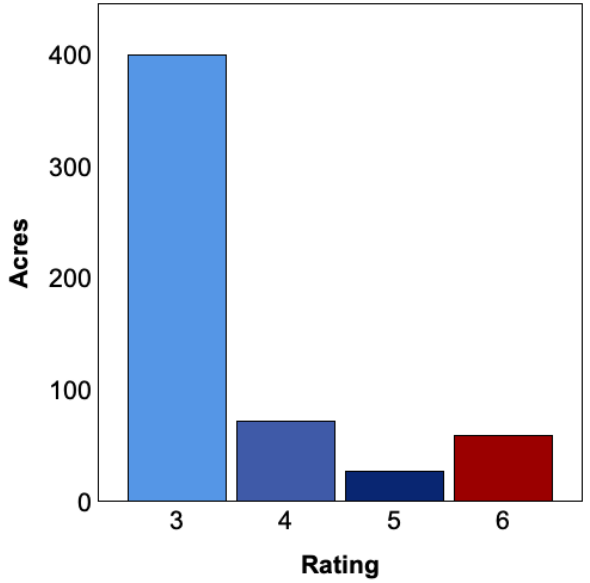
Weedy Rice March 2022



Statewide weedy rice infestation rating, 2022



San Joaquin County weedy rice infestation rating, 2022



Conclusions

- Type 1 most widely distributed
  - In San Joaquin County, 600 acres of type 1
- Most infestations are rating 3
- Type 3 only on the west side in Sacramento Valley
  - Identified 20 years ago, difficult to eradicate, but not expanding
- Type 4 and 6 only in one location each
  - In same location for several years, not getting worse