

Arthropods and Diseases in No-till and Drill-Seeded Rice

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Because these systems are not widely used in California, we do not know a lot about what arthropod and disease challenges will be. Below are a few observations.

Arthropods

- Tadpole shrimp (TPS)
 - Tadpole shrimp should not be a problem in drill seeded rice. If flushed, TPS eggs and very young TPS will be moved off the field with the water. This is what we observe when conventional growers do leathers method.
 - If there is no flush, TPS will hatch when permanent flood is applied. At this time, TPS won't hurt the rice, but they will feed on germinating weeds. Research is currently underway to see what weeds are preferred by TPS.
 - Unknown how no-till will affect TPS.

- Rice water weevil (RWW)
 - Rice water weevil is not a major pest in California. It is a serious pest in the southern states, where rice is drill-seeded.
 - The floodwater is what attracts the RWW to the field, so in drill-seeded fields RWW would infest fields when the permanent flood is applied.
 - Unknown how no-till will affect RWW.
 - Currently, California doesn't have RWW populations high enough to cause problems.

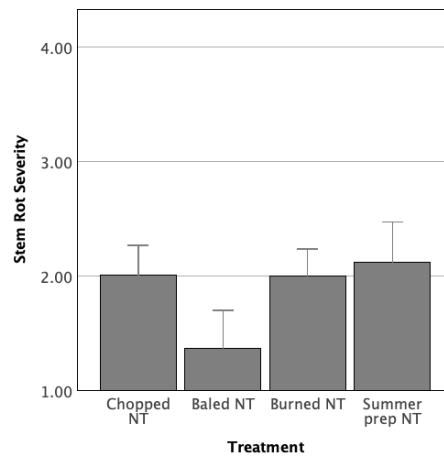
- Armyworms
 - Unknown if there would be any difference between no-till, drill-seeded rice and water seeded rice.
 - In the southern US, fall armyworms (*Spodoptera frugiperda*) can affect seedlings at 2-3 lsr, before the permanent flood. A lot of times flushing or flooding solves the problem.

Diseases

- Seed rot and seedling diseases
 - Seed rot, or water mold, won't be a problem in drill-seeded rice; however, seedling diseases can still occur. Cold, wet weather is favorable for seedling diseases.

- Bakanae
 - Bakanae can occur in drill-seeded rice. Inoculum is more commonly found in the seed, but it can also be in the soil.
 - The main method of prevention is to use clean seed.
 - Since seed in drill-seeded rice is not soaked, sodium hypochlorite cannot be used.
 - In other rice production regions, seed treatments are available.

- Tiller diseases and smut
 - Tiller diseases and smut can occur under drill-seeded rice. For tiller diseases, just as with water seeding, when straw is removed the amount of inoculum in the field is reduced.
 - Straw management under any system will have the biggest effect.



Comparison of stem rot severity between no-till, drill-seeded basins. Biggs, 2023.

- Blast
 - Drill-seeded rice has a higher blast risk. M-210 should be used.
 - Part of the reason why drill-seeded rice can have more blast, is because seed-to-seedling blast infection require aerobic conditions. Under water-seeding, there is no seed-to-seedling infection.