

Managing rice in a late planted year

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Here we discuss how to manage rice when the planting date is later than normal. Late planting may be due to a number of reasons such as weather, machinery breakdown, water availability, etc. Regardless, our research has shown that delayed planting reduces yield potential (yields tend to be about 5 sacks/acre less when planted at end of May compared to beginning of May - approximately 1 sack/ac for each week delay in May). Furthermore, late planting pushes harvest later into fall where rains delay harvest, reduce quality and drive up drying costs. In this article we discuss practices that will help manage rice in these sorts of situations. At the end we also have some "Frequently Asked Questions".

Land preparation

Land preparation typically starts at the beginning of April when soils are dry enough to open the ground - allowing soils to dry out faster. As we write this in mid-April, little to no ground has been opened up and more rain is in the forecast. On a positive note, the long wet winter and spring will likely have resulted in better straw breakdown than a typical year. This may make ground work a bit faster and easier and possibly let you get by with one less pass. That said, you do not want to skimp too much on seedbed preparation. Good weed and water management later in the season depend on a good seedbed.

Varietal selection

Good variety selection is key. You want a short duration variety that is cold tolerant. M-206 and M-105 are both good options. The shorter duration will allow for earlier harvest. However, cold tolerance is important as well.

Water management

A late planting date shifts the early booting stage (when rice is sensitive to cool temperatures and blanking) later in the year when night time temperatures are lower. Thus, in addition to proper variety selection, it will be important to raise flood water height to about 8 inches between PI and heading to protect the emerging panicle from the cold temperatures.

Fertility management

Nitrogen rate: You do not want to over apply N. Over application will delay harvest and increase risk of blanking. Given these risks, a shorter growing season, and the reduced yield potential due to late planting, you may consider reducing overall N rate by 5-10% from what you typically apply.

Starter fertilizer: Apply P and K only if needed. If your soil P values are above 15 ppm (Bi-carbonate P) or if your soil K values are above 120 ppm, applications of these nutrients may not be necessary. If you do not need P and K then do not apply a starter but rather apply all N as aqua. If applying a starter fertilizer, consider applying 20-30 days after planting. This has several benefits: it eliminates a pass before planting allowing for earlier planting, it reduces scum build up (more likely in a late planted year due to warmer weather), and it can replace the post-herbicide N application that many growers have been doing.

Top-dressing N: Only top-dress if necessary. A leaf color chart is a good tool to determine if it is necessary. Unnecessary top-dressed N increases costs, delays harvest and can reduce yields. Our research continues to confirm that splitting N between a preplant and top-dress N application has no yield benefit compared to applying it all preplant.

At all costs you want to avoid a situation where you have N fertilizer in the field and you are not able to flood the field. In wet years, this can be a problem as rainfall may necessitate halting fertilizer applications or other field work after fertilizer operations have already begun. If fertilizer gets wet and you are not able to flood it is almost impossible to figure out how much N is potentially lost. Good planning and checking weather forecasts will help avoid these situations. A couple of days delay in planting is likely better than getting caught in the above scenario which will not only result in fertility management problems but also weed problems.

Weed management

It is likely that the weather will be warmer at later planting dates. Weeds will emerge and grow quickly, due to the warmer temperatures. Late watergrass and early watergrass may emerge before the rice in a flooded field. This means that you will need to be careful about herbicide application timing. It will be important to apply herbicides based on weed and rice growth stages, not based on days after seeding. If applications are made based on the number of days after seeding, they will be applied too late, and this will result in poor control. In general, applications should be as early as possible based on the labeled recommendations for each herbicide.

Due to warm temperatures, some herbicides will work better. This will be good for weed control, but the herbicides will also be harder on the rice, causing more phytotoxicity than normal. You may see greater stand reduction with Cerano. ALS-inhibitors (Granite GR/SC, Sandea, Halomax, Londax, Strada, and Regiment) may cause stunting especially when applied at early growth stages but the rice should recover.

Pest management

Late planting will result in warmer temperatures during seedling development. Seedling pests like tadpole shrimp (TPS) and rice water weevil (RWW) will develop faster and have the capacity to cause more injury. Tadpole shrimp eggs need a period of dehydration before hatching in the spring. With the wet weather, we might not get as many eggs hatching as in previous years. However, as ground is worked, TPS on the soil surface will dry and will be ready to hatch when fields are flooded. Under warm weather, TPS will grow and reach a size that can injure rice fast (as quickly as 5 days after the flood is initiated). Germinating rice seeds and seedlings that only have a coleoptile (no green tissue yet) are preferred by the TPS. Monitor your fields closely during this time and use an insecticide if you see TPS before the rice has any green tissue.

RWW overwinters in vegetated areas around rice fields, and fly to flooded fields during warm and calm nights. Usually the period of RWW flight is extended during several weeks starting in April, but with the current conditions, we might see a more concentrated flight period once temperatures start going up. If you are in an area with a history of RWW problems, it might be wise to do border treatments soon after the seedlings break the water line. Remember that with

the pyrethroids you are controlling adults, preventing them from laying eggs on the rice seedlings. Once the eggs hatch and the larvae dig in the mud, the pyrethroids can not kill them. Belay controls adults, but can also control larvae, allowing for treatments when larvae are found feeding on rice roots. Nevertheless, Belay can only be applied until the third tiller is initiated (when the 6th true leaf emerges).

I am not sure how late planting will affect armyworms. We could see infestations occur when plants are younger than usual, which would make the effect of defoliation more severe. On the other hand, the wet winter and spring may have reduced overwintering populations and we might not see the population levels that we saw last year or the year before. In any case, we will be monitoring armyworm moth flight during the season and will be distributing this information through the UC Rice On-line website. Last year's monitoring showed that we can detect flight peaks one to two weeks before armyworms are seen in the field. This information can be used to time scouting.

Blast has not been much of a problem for the past two years. However, looking back at my notes for the 2010 season, when blast was a widespread problem through the valley, I have late planting as one of the factors that probably contributed to the problem. As plants age, they become more resistant to blast infections. Younger plants during weather periods that allow for blast development may allow for more infections that can increase incidence (number of plants affected) and severity (how bad the infections are). If we have a year that is good for blast, managing the crop to limit conditions that favor blast is the best way to prevent infections. To prevent blast, avoid excessive N fertilization, avoid draining the field during crop development, plant less susceptible varieties (M-206, M-208), and avoid plant stresses like nutrient deficiencies, salinity and herbicide injury. If you plant varieties that are less tolerant such as M-209, M-205, M-105, or M-104, keep a close eye on the field during boot and heading.

No-till rice

No-till may be a practice that is considered in a late planted year. Since you are not doing tillage work, it has the potential benefits of allowing an earlier planting and reduced costs associated with tillage operations. In addition, weed control costs may be reduced. In previous work at the Rice Experiment Station we found that yield potential in no-till systems was similar to conventional systems. Here are some things you should consider when practicing no-till:

1. You want to select the proper fields. They should not be rutted from the previous seasons harvest events. The field should not have a straw mat across the surface (i.e. from using a cage roller in the fall) which could impact root penetration. Some standing stubble is not a problem as it helps young seedling stay in place in case of high winds.
2. If it has rained recently and you CAN see emerged weeds:
 - a. Apply a non-selective herbicide, such as glyphosate to kill emerged weeds. It is recommended to apply glyphosate by ground rig, not by air, to avoid drift issues. Flood fields 24-48 hours after application and seed into the flooded field.
3. If it has not rained recently and you DON'T see emerged weeds, you can:
 - a. Flood and seed the field OR
 - b. If you want to recruit more weeds, you could flush the field with water to germinate weed seeds and then kill these weeds before flooding and planting the field (we call

this a stale seedbed). To ensure maximum control, you should wait at least 1 week between the flush and the glyphosate application.

4. Use a higher seeding rate to ensure good stand density.
5. Although the pre-plant glyphosate application should kill most grasses, it will be necessary to follow up with a sedge and broadleaf herbicide at the 3-4 leaf stage of rice.
6. You want to avoid disturbing soil and bringing new weeds to the surface so all fertilizers should be applied to the surface. This means using urea pellets instead of aqua. We recommend applying urea preplant to the soil before flooding. Flooding will help move the urea into the soil. Do not apply urea immediately after flooding. If you do not apply before flooding, you could wait about 3 weeks and apply the urea at that time. Apply starter fertilizer by plane after rice leaves have emerged above the soil surface to avoid scum. You may need to apply a top-dress N application as N fertilizer applied to soil surface is generally not used as efficiently as injected aqua. Use a leaf color chart to help make this decision.
7. Keep water level low in field until roots anchor into soil.

Frequently asked questions

I have applied my aqua and then it rained preventing me from rolling the field and applying starter fertilizer. What should I do?

Under these circumstances, I would flood the field ASAP and apply the starter blend by plane 20-30 days after planting. Allowing the aqua to sit in an unflooded soil for a long period of time allows the fertilizer to begin to convert to nitrate (NO₃) which will be lost when the field is flooded (due to denitrification). It is very difficult to estimate how much is lost so further N fertility management becomes a bit of a guessing game.

I finished my land preparation and it rained before I could apply my fertilizers and roll the field. Do I need to do another tillage pass to kill germinating weed seeds?

If weeds have started to germinate, the best way to get rid of them is to use a non-selective herbicide such as glyphosate. Tillage can bring up more weed seeds from below the soil surface, especially if it is deep tillage. Furthermore, some emerged weeds may not be killed with tillage. This is especially true of ricefield bulrush, which has roots that are rhizomes (tubers), which can re-sprout after tillage.

The best way to eliminate weeds after a rain is to use a non-selective herbicide, such as glyphosate. If using glyphosate, make sure the weeds have 1-2 leaves, to ensure that the herbicide can be taken up by the plant. Applications to bare soil will be ineffective, as it is not a soil-active herbicide. After application, wait 24-48 hours, flood, and immediately seed into the flooded field. It is recommended to apply glyphosate by ground rig, not by air, to avoid drift issues.