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RICE BRIEFS

February 2008

In this issue…

Rice Straw Meeting
Tips on an Emerging Rice Straw Market: High-value Straw is Headed to Dairies

The combination of the drought, increases in feed costs and increasing numbers of dairy cows in California presents a market for rice straw to dairies. The past two years of demonstration funded by the Rice Research Board have allowed for definition of the field treatment to make "ready-to-feed" rice straw for dairy heifer rations. The objective of the meeting is to inform rice producers what was learned about production of a product that the dairies can use. Please join us to learn how to participate in this value-added rice straw market.

WHEN & WHERE:
Thursday March 6, 10 am
Colusa Industrial Properties Conference Room – 100 Sunrise Blvd., Colusa, CA

AGENDA:
Size and Scope of the Dairy Market – **Peter Robinson**, UCD Dairy Nutrition Specialist
Dairy Heifer Feeding Overview – **Peter Robinson**, UCD Dairy Nutrition Specialist
Dairy Defined Straw – **Ken Collins**, Biggs Farming
2006 and 2007 Demonstration Survey and Results – **Marta Santos**, UCD Grad Student
Review of the Draft Rice Straw Producer's Publication – **Glenn Nader**, UC Livestock Advisor
Conference Call with Dairymen, Nutritionist, and Managers

Lunch provided by the California Rice Commission

Alternative Stand Establishment Methods: Management Tips

L.A. Espino, A.J. Fischer, C.A. Greer, J.E. Hill, B.A. Lindquist, and R.G. Mutters

Stale Seed Bed – Water-Seeded Rice

1. Cultivate the field in the spring to prepare the seed bed in the usual fashion.
2. After rolling, flood the field to germinate weed seeds.
    a. Watergrass seeds: maintain flood or saturated soil for 4 to 5 days.
    b. Sedge & broadleaf seeds: maintain flood or saturated soil for about 10 days.
3. Dry-up the ground. Apply glyphosate (Roundup) to kill germinated weeds; approximately 10 to 14 days after drain.
4. Do not disturb the soil after Roundup treatment to avoid bringing more weed seeds to the surface.
5. Apply nitrogen (N) at 20-60 lb N/ac to soil surface (optional).
    a. Use ammonium sulfate if you typically see a benefit from sulfur.
    b. Use urea if you can flood quickly.
    c. May want to skip phosphorus (P) to avoid algal problems if you have been applying it on a regular basis. Potassium (K) can be applied with N if needed. Consider applying P and K in the fall.
6. Flood field.
7. Seed with pre-germinated seed at a heavier rate than usual (~200 lb/ac).

There are two options following seeding*

1. Drain field for stand establishment (especially if ground was not dried and soil oxygen concentration may be low).
    a. Apply bulk of N as urea immediately prior to permanent re-flood.
    b. Top 1" of soil must be dry so that flood water will drive urea into soil and prevent losses.
2. Maintain a continuous flood and raise water depth as seedlings develop.
    a. Apply bulk of N as ammonium sulfate at the 3-4 leaf stage rice or when rice roots are well developed.

* Each of these methods will require subsequent monitoring of leaf N content to ensure adequate N levels at panicle initiation.

Stale Seed Bed – Water-Seeded Rice - Weed Management

Note: Draining the field to stimulate rice stand establishment may stimulate germination of grasses. Sedges and aquatics may be a problem in this system.

Weed Management Options with Drainage for Stand Establishment

1. Pre-plant glyphosate (Roundup).
2. Foliar herbicide application at 3 leaf stage rice.
3. Into the water application after reflooding, or foliar application with rice $\geq$ 4 leaf stage to tillering with water lowered for 70% exposure of weed foliage.

Weed Management Options with Continuous Flooded System

1. Pre-plant glyphosate (Roundup).
2. Into the water herbicides.
3. Foliar herbicide options for 1-3 tiller rice with water lowered if needed for 70% exposure of weed foliage.

2007 Herbicide Program

1. Pre-flood: Roundup Weather Max (glyphosate) 1.4 lbs a.i./acre plus 2% ammonium sulfate (May 29).
2. Post emergence: Propanil + Granite SC (6 lb a.i./a + 2 oz/a, respectively) at the 4-5 leaf rice stage (June 27).

Conventional Drill-Seeded Rice

1. Cultivate the field in the spring to prepare the seed bed in the usual fashion through land planning.
    a. Need a smooth seedbed with small clods.
    b. Need a leveled field with good drainage and no low spots.
    c. Soil must be dry (but not too dry) to achieve a shallow seed depth with drill.
2. Pre-plant application of 1/3 total N.
    a. ~30-50 lb N/ac as ammonium sulfate.
    b. N may be applied with drill.
    c. Total N requirement may be little higher than in a conventional water-seeded system.
3. Seed at a rate of about 100 lb/ac.
    a. 5-7" spacing.
    b. Depth < 1".
4. Flush/drain to promote rice germination.
    a. Rice seed may not germinate in low spots with standing water.
    b. Rapid water movement in fields with lighter textured soils may bury the seeds in some areas and thin the stand.
5. May need to flush again prior to permanent flood depending on the weather. Hot, windy weather can cause the soil to crust before the seedlings emerge.
6. Apply 2/3 total N just prior to permanent flood.
    a. 100 to 120 lb N/ac as urea.
    b. Top 1" of soil must be dry so that flood water will drive urea into soil layer and prevent N volatilization losses.
7. Apply permanent flood when rice plants are large enough to be above water; typically between the 4 leaf and tillering stage.

Drill-Seeded Rice – Weed Management

The biggest weed problems will be watergrass, barnyardgrass and sprangletop, followed by smallflower umbrellasedge. Weed infestations in drill-seeded rice may be heavier than in water-seeded rice. This system allows for the use of pendimethalin (Prowl), which will be the herbicide of choice if the field is known to have resistant watergrass. Prowl is a soil-acting herbicide that provides pre-emergent control of watergrass, barnyardgrass and sprangletop until the field is permanently flooded. Its residual activity is much reduced once fields are flooded.

Weed Management Options with Drill-Seeded Rice

1. Herbicide options:
    a. A pre-emergent herbicide application after the first flush of irrigation followed by a foliar application prior to permanent flooding.
    b. A foliar herbicide in tank mixture with a soil residual herbicide applied when rice is at the 2-4 leaf stage.
2. Come back with a foliar herbicide application after permanent flood if needed to control a new flush of weed emergence; water should be lowered for 70% weed foliage exposure to the herbicide.

2007 Herbicide Program

1. Propanil, Prowl, and Clincher (6 lb a.i./a + 2.1 pt/a, 13.3 oz/a, respectively) at the 3 leaf rice stage (June 7).

Rice Establishment Systems in 2007

The following alternative rice establishment systems have been developed and evaluated since 2004: 1) conventional water-seed rice, 2) conventional drill-seeded rice, 3) water-seeded rice after spring tillage and a stale seedbed, 4) water-seeded rice after a stale seedbed without spring tillage, and 5) drill-seeded rice after a stale seedbed without spring tillage. Following is a list of these treatments with a summary of crop establishment practices and herbicides used in 2007.

CONVENTIONAL WATER-SEEDED:

Crop establishment:

- Spring tillage
- Permanent flood May 22
- Water-seeded May 31

Herbicides:

- Propanil + Granite SC (6 lb a.i./a + 2 oz/a, respectively) at the 4-5 leaf rice stage (June 27).

CONVENTIONAL DRILL-SEEDED:

Crop establishment:

- Spring tillage
- Drill-seeded May 30
- Flushed for establishment May 31, additional flush June 6
- Permanent flood June 16

Herbicides:

- Propanil, Prowl, and Clincher (6 lb a.i./a + 2.1 pt/a, 13.3 oz/a, respectively) at the 3 leaf rice stage (June 7).

WATER-SEEDED / STALE SEEDBED:

Crop establishment:

- Spring tillage
- Flushed for weed recruitment May 1 and May 13
- Water-seeded June 1

Herbicides:

- Pre-flood: Roundup Weather Max (glyphosate) 1.4 lbs a.i./acre plus 2% ammonium sulfate May 29.
- Post emergence: Propanil + Granite SC (6 lb a.i./a + 2 oz/a, respectively) at the 4-5 leaf rice stage (June 27).

WATER-SEEDED / STALE SEEDBED / NO TILL:

Crop establishment:

- Flushed for weed recruitment May 1 and May 13
- Water-seeded June 1

Herbicides:

- Pre-flood: Roundup Weather Max (glyphosate) 1.4 lbs a.i./acre plus 2% ammonium sulfate May 29.
- Post emergence: Propanil + Granite SC (6 lb a.i./a + 2 oz/a, respectively) at the 4-5 leaf rice stage (June 27).

DRILL-SEEDED / STALE SEEDBED / NO TILL:

Crop establishment:

- Flushed for weed recruitment May 1 and May 13
- Drill-seeded May 30
- Flushed for establishment May 31, additional flush June 6
- Permanent flood June 16

Herbicides:

- Pre-plant: Roundup Weather Max (glyphosate) 1.4 lbs a.i./acre plus 2% ammonium sulfate May 29.
- Propanil, Prowl, and Clincher (6 lb a.i./a + 2.1 pt/a, 13.3 oz/a, respectively) at the 3 leaf rice stage (June 7).

Note: Crop oil concentrate (1.25% v/v) was added to applications of Clincher and Propanil. Ammonium sulfate (2% by weight) was added to applications of Roundup.

This meeting announcement is produced by:

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