PROJECT NO. RU 10

ANNUAL REPORT COMPREHENSIVE RESEARCH ON RICE
January 1, 2013 - December 31, 2013

PROJECT TITLE: **Demonstration of Rice Haylage Production**

PROJECT LEADER (include address):
Glenn Nader
UC Livestock Advisor, Butte/Sutter/Yuba Counties
142-A Garden Hwy., Yuba City, Ca. 95991
ganader@ucdavis.edu

PRINCIPAL UC INVESTIGATORS (include departmental affiliation):
Peter Robinson - UCD Dept. of Animal Science Extension Nutritionist
Josh Davy – UCCE Livestock Advisor, Tehama/Glenn/Colusa

COOPERATORS:
Herb Holzapfel
Ron Lagrande

LEVEL OF 2013 FUNDING: **$7,650**

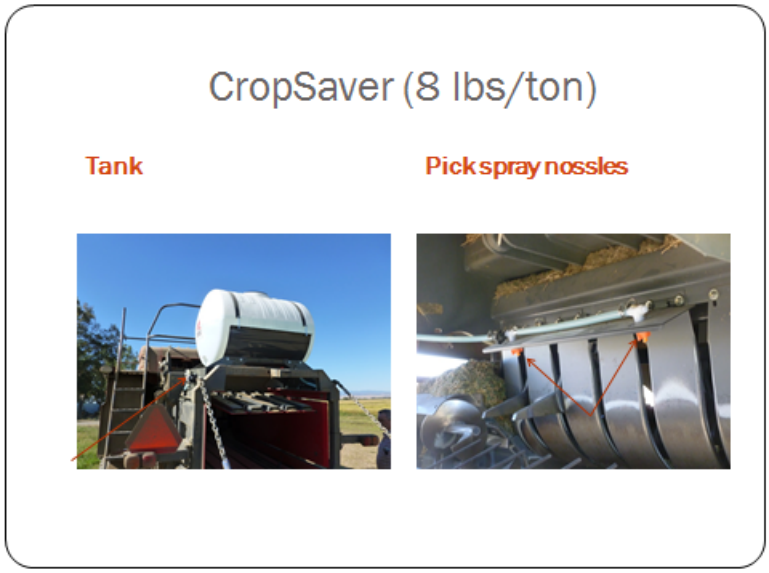
OBJECTIVES AND EXPERIMENTS:

Objective 1 –Demonstrate the haylage production of Rice Straw
Research by Robinson and Nader has previously documented the significant loss of forage quality by rice straw during drying. At the time of harvest, the energy values for rice straw were near that of low quality alfalfa, but at the end of the 48 hour drying period, these had declined dramatically to those of a very low quality forage. The reasons for these dramatic changes are not understood at this time. Haylage is the process of putting up forage under high (45 to 65%) moisture. At the time of harvest most rice forage is about 60% moisture, which is acceptable moisture level for haylage. Previous work with rice haylage was done with individual bale plastic wrapping that made the process too costly to implement. Field test of a much cheaper method of tarping a large stack of bales was conducted.

SUMMARY OF 2013 RESEARCH
Objective 1 –Demonstrate the haylage production of Rice Straw
Rice straw was baled in the windrow right after harvest at 49% moisture content at the Holazapfel ranch in Willows, California. Moisture probes do not provide the proper moisture content, as they are programed for much lower moisture range. Moistures above 75% can cause botulism. Samples were dried overnight at 105 degrees and pre and post weights were used to determine dry matter.

Three different rice straw haylages were put up and will be evaluated:

1. Haylage without treatment
2. Haylage with Crop Saver applied at the time of baling
3. Urea and UN32 application



Twenty, one ton bales per treatment were from baled from two neighboring checks. They were stacked in the same north/south direction. Tarp was used to cover each treatment as 3 separate stacks. Two temperature recorders were placed in the each stack set to record temperature hourly.

Core samples will be taken for at

1. Day of stacking before covering
2. 30 after baling
3. 60 days after baling
4. 90 days after baling
5. 120 days after baling

The tarp is taped after sampling to limit air getting into the haylage.

Results

Nutritional analysis will be done on all samples at one time at the completion of sampling to reduce analysis run variability.

Temperature, pH, density and dry matter were analyzed at each sampling date. The results are seen below.

HERB'S STACKS AFTER THREE SAMPLINGS

	Treatment									Sample Depth (D: inches)			
	Start			30 d			60 d						
	Control	Urea	HS	Control	Urea	HS	Control	Urea	HS	5 to 10	10 to 15	15 to 20	SEM
Temperature (0C)	28.12	32.30	29.93	34.83	36.72	41.45	28.08	24.53	25.75	28.52	32.25	33.14	0.718
Temperature (0F)	82.6	90.1	85.9	94.7	98.1	106.6	82.5	76.2	78.4	83.3	90.1	91.7	1.29
pH	7.07	7.34	5.89	8.58	8.15	8.56	8.61	8.15	8.17	8.01	7.92	7.56	0.082
DM %	44.3	49.9	55.6	60.4	75.3	76.9	39.5	41.9	48.7	50.7	56.6	56.8	2.00
Wet density (lbs/ft^3)	9.32	8.60	7.36	6.02	4.10	3.38	5.57	7.27	5.02	6.02	6.18	6.67	0.446
Dry density (lbs/ft^3)	4.08	4.17	4.03	3.60	3.05	2.57	2.42	3.40	2.57	2.98	3.34	3.63	0.256

There were no other statistically significant 2 way interactions, or the three way interaction

Rice straw haylage was made at the Ron LaGrande ranch in William, California. Two checks were baled and placed in two stacks. One was treated stack received both UN32 and urea treatment. As time ran out during the day the other stack just had UN32 sprayed on the outside.

Results

Nutritional analysis will be done on all samples at one time at the completion of sampling to reduce analysis run variability.

Temperature, pH, density and dry matter were analyzed at each sampling date. The results are seen below:

RON'S STACKS AFTER TWO SAMPLINGS

	1st Sampling		2nd Sampling		Sample Depth (D: inches)				P			
	UN32	UN32 + Urea	UN32	UN32 + Urea	5 to 10	10 to 15	15 to 20	SEM	Trt	Time	Depth	Trt*Time
Temperature (0C)	31.3	36.1	27.6	30.7	29.5	29.8	35.0	1.86	0.03	0.01	0.03	0.64
Temperature (0F)	88.16	95.54	81.7	87.3	85.1	85.6	95.0	3.34				
pH	7.66	8.34	8.32	8.24	8.71	8.22	7.50	0.245	0.22	0.25	<0.01	0.12
DM%	49.6	54.9	47.9	43.4	48.8	49.0	49.1	2.88	0.89	0.02	0.99	0.08
Wet density (lbs/ft^3)	11.6	7.4	7.3	13.5	9.8	9.1	11.0	1.24	0.40	0.45	0.42	<0.01
Dry density (lbs/ft^3)	5.8	4.1	3.6	5.9	4.7	4.4	5.3	0.60	0.62	0.71	0.50	<0.01

There were no other statistically significant 2 way interactions, or the three way interaction

PUBLICATIONS OR REPORTS: None at this time

CONCISE GENERAL SUMMARY OF CURRENT YEAR'S RESULTS:

Objective 1 –Demonstrate the haylage production of Rice Straw

At 60 days after baling, the rice straw haylage that was treated with urea and UN32 and Cropsaver did not have visible mold forming. The urea and UN32 treatment at the stack is more labor intensive that the Cropsaver application on the baler. The preventing mold is the first important step. Evaluation of animal intakes and nutritional analysis will determine if this is a viable method of utilizing rice straw for cattle feed.