

Research and Education

USDA-ARS Facility to Conduct Grazing Behavior Research

A research project in grazing behavior and pasture intake by dairy cows was recently initiated at the USDA-Agricultural Research Service (ARS) that will provide new information for organic dairy producers. The project, headed by Kathy Soder and her postdoctoral research associate, Pablo Gregorini, will, among other things, evaluate the effects of supplementation strategy in relation to grazing behavior and pasture intake of dairy cows. One objective of this work is to evaluate and develop science-based recommendations to meet targeted pasture intake goals that are suitable for use by regulatory agencies, grazing advisors and consultants, and producers, such as the proposed 30 percent minimum daily dry matter intake that is currently being proposed by several organic dairy organizations.

Soder, a Research Animal Scientist with the USDA-ARS-Pasture Systems and Watershed Management Research Unit (PSWMRU), is currently conducting research to develop supplementation strategies for grazing dairy cows that complement or alter pasture diet selection based on farm goals, available forages, and nutritional quality of forage. Other research includes evaluation of physical and chemical attributes (such as forage height, forage yield, leaf length, height, and density, and nutrient composition) of forage species that affect grazing behavior, including bite rate (number of bites per minute), bite mass (weight per bite), time spent grazing, and diet selection within mixed species pastures.

As a Postdoctoral Research Animal Scientist with the USDA-ARS-PSWMRU, Gregorini is interested in non-traditional grazing experiments to develop new guidelines for practical foraging/feeding management. Current research activities include matching plant and animal processes to alter nutrient supply in grazing cattle, the effect of strategies of supplementation on pattern of functional foraging preference, the effect of animal internal state on foraging dynamics and short-term forage intake, and chemical and biomechanical features of forage as affected by time of day.

According to Soder, preliminary studies showed that type, amount, and timing of supplement can greatly influence forage intake from pasture. However, little is known about the mechanisms that drive these changes, nor is there enough information to recommend supple-

mentation strategies to best complement or alter pasture intake. This information is critical to understand the complex interactions that occur during the grazing process that drives diet selection. ♦

Winter Grain Research in Maine

*By Rick Kersbergen (UMCE),
Tim Griffin (USDA/ARS) and
Tom Molloy (MAFES)*

There has been a lot of interest in winter grain production, especially in light of the wild grain prices we are experiencing in both the conventional and organic grain markets. Last year, we started a SARE project "Expanding Grain Production in Maine and Vermont LNE06-240" with Heather Darby and Sid Bosworth from UVM and Tim Griffin from the USDA /ARS New England Plant Soil and Water Lab in Orono. The spring grains we planted in 2006 were a disappointment, both in terms of forage yields, (harvested in either the boot stage or soft dough stages) and grain yields (remember

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the weather last year?).

In the fall of 2006 we planted a number of winter grains and experimented with planting dates as well as trying to evaluate how best to provide fertility to these grains in an organic system. Concurrently, Henry Perkins from Bull Ridge Farm in Albion initiated a SARE Farmer/Grower trial investigating winter spelt for forage and grain production. Henry also is evaluating three different fall planting dates.

While all the data we have so far on winter grains is preliminary and relates to forage yield, we can draw some conclusions, especially about planting dates and the impact on forage yields the following spring. When you look at the tables and pictures, you can see that there was a significant decrease in forage yield and canopy closure in the spring by delaying the planting date of winter grains from the middle of September to the middle of October. This is even more significant if we consider how warm our fall was in Maine with warmer than normal temperatures through December. We will see if this ultimately translates into a reduced grain yield later this summer.

We have data on the boot stage harvest from some replicated trials at the University of Maine Rogers Farm, with spelt, wheat, rye and Triticale. Table 1 shows the two planting dates 9/20 and 10/17 and the impact of boot stage forage yield in pounds of dry matter per acre.

These plots indicate the difference we saw in the planting dates of Triticale 336 and Oberhauser Spelt earlier this spring.



Trical 336 planted 10/17/06

Trical 336 planted 9/20/06



Oberhauser spelt planted 10/17/06

Oberhauser spelt planted 9/20/06

At Henry’s farm we measured the yield of winter spelt in replicated trials in the boot stage (5/31/07) planted at three different dates last fall (9/15, 9/30 and 10/15).

| Bull Ridge Farm Winter Spelt | | | |
|-------------------------------------|--------|--------|--------|
| Planting Date | 15-Sep | 30-Sep | 15-Oct |
| Yield DM lbs/acre | 3400 | 2600 | 840 |
| Stems/meter row | 125 | 107 | 84 |

Another of our farmer researchers in Maine, Jeff Bragg from Rainbow Valley Farm in Sidney planted a number of winter grains for us on his farm on 9/16/06. His yield data for Trical 336 in the boot stage yielded 3.56 tons of dry matter per acre on May 31st! His yields of other small grains were similar to our data from the early planted Rogers Farm.

| Rainbow Valley Farm Boot Stage 5/31/07 | |
|---|---------------------------|
| | Yield lbs/acre Dry matter |
| Trical 336 | 7120 |
| Wheat (Frederick) | 3260 |
| Spelt | 3400 |
| Wheat (Richmond) | 2800 |
| Rye | 3120 |

| Table 1 | | |
|---|----------------|----------------------|
| Early Planting (Sept 20 2006), Rogers West | | |
| | Date Harvested | DM Yld lbs. Per acre |
| Rye | 21-May | 926 |
| Oberhuaser Spelt | 8-Jun | 3377 |
| Sungold Spelt | 8-Jun | 2583 |
| Tritical 336 | 29-May | 3068 |
| Trical 815 | 4-Jun | 1419 |
| Frederick Wheat | 8-Jun | 3186 |
| Richland Wheat | 8-Jun | 2639 |
| Late Planting (Oct 17 2006), Rogers West | | |
| Rye | 29-May | 303 |
| Oberhuaser Spelt | 15-Jun | 2592 |
| Sungold Spelt | 11-Jun | 2164 |
| Tritical 336 | 4-Jun | 1083 |
| Trical 815 | 15-Jun | 723 |
| Alzo Triticale | 15-Jun | 1988 |
| Richland Wheat | 11-Jun | 2208 |



Winter spelt planted at Henry Perkins on 9/15/06 (left) and 10/15 (right). The unwilling participant in the picture is about 5'8" tall.

We have been very excited about the opportunities for organic dairy farmers to grow winter grains to reduce the cost of purchased supplements. We will continue to trial both spring and winter grains to try and fine tune organic management practices. Tim Griffin is researching nitrogen management practices for winter grains and alternative methods that organic farmers might be able to use to apply manure to winter grains in the spring to provide some needed nitrogen.

Many of these trials have also been replicated in Vermont under the watchful eyes of Heather Darby. ♦

A Farmer's Breeding Club in Vermont

*Dr. Heather Darby, UVM Extension and
Jack Lazor, Butterworks Farm*

In the spring of 2007, we received a USDA SARE grant to begin building farmer knowledge in the area of plant breeding. Currently there are few grain varieties being developed for organic farmers in the Northeast. Vermont is primarily a dairy state with a major focus on forage crops. Our cool climate and abundant rainfall offer us a unique growing opportunity along with many production challenges. Seed selections for forages and cereal grains are often very limited. Most available varieties are developed in regions with climates, soils, and management techniques that are very different than ours. In addition, those released are genetically homogenous and inbred for uniformity. This has often led to rapid breakdown of the genetic resistance to local diseases. These varieties are also the property of private seed companies and farmers are no longer freely able to save low cost seed as in the past. To address this situation farmers need to gain the technical skills needed to make their own crosses of small grain varieties and to learn how to make selections from their new populations under organic management. Plant breeding is a

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