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 supplementation 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.

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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 (Continued on page 30)
(Continued from Winter Grain page 29)

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 Per-
kins from Bull Ridge Farm in Albion initiated a SARE
Farmer/Grower trial investigating winter spelt for for-
age 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 can-
opy 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 mat-
ter per acre.

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

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).

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.

<table>
<thead>
<tr>
<th>Bull Ridge Farm Winter Spelt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planting Date</td>
</tr>
<tr>
<td>DM Yld lbs/acre</td>
</tr>
<tr>
<td>Stems/meter row</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rainbow Valley Farm Boot Stage 5/31/07</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield lbs/acre</td>
</tr>
<tr>
<td>Trical 336</td>
</tr>
<tr>
<td>Wheat (Frederick)</td>
</tr>
<tr>
<td>Spelt</td>
</tr>
<tr>
<td>Wheat (Richmond)</td>
</tr>
<tr>
<td>Rye</td>
</tr>
</tbody>
</table>

continue on p. 27
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. *

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

(Continued on page 32)