



Small Grains for Supplemental Forage

Under optimal conditions, alfalfa, corn silage, and perennial grasses have proven most effective in fitting into economical dairy rations. It is now rare to find alfalfa seedings accompanied by a small grain companion crop, for weed control and for seeding year forage. There are circumstances, however, in which small grains are worth considering, and they can fit in dairy rations.

Reasons for Considering Small Grains

Winter injury of perennial forage crops may reduce the anticipated supply of forage for the next season. Cold temperatures, lack of snow cover, and ice sheeting can damage forages, particularly alfalfa. Spring or late summer seedings of perennial forages can fail to become established. On average this may occur about 10% of the time.

A very wet spring season may prevent timely planting of corn for silage, or may cause a planted stand to fail. For more information on late corn planting, see Grass Fact Sheet #26. Extended drought or flooding may severely decrease forage supplies. Winter small grains may allow for a double cropping option with short season corn, sorghum or millet.

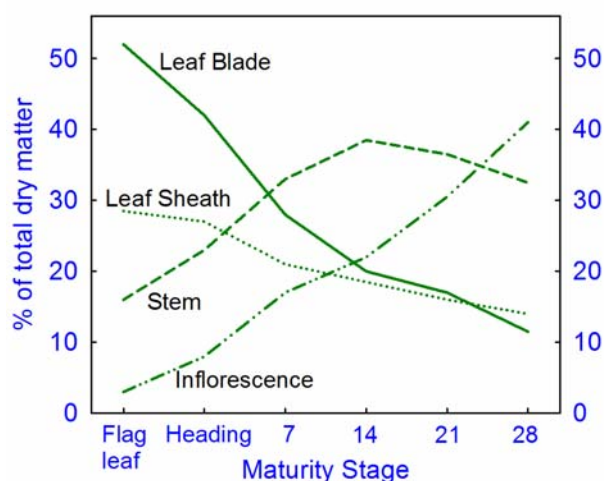


Figure 1. Change in composition of small grains with maturation. Maturity stages 7-28 are the number of days after heading.

Forage Quality

Whether a small grain is sown alone or interseeded with another crop, the crop should be harvested at the flag leaf (mid-late boot) stage for lactating dairy cows. Fiber digestibility, near 80% at flag leaf stage, declines linearly and quickly. As with all grasses, the stem component of the forage increases quickly (Fig. 1), increasing yield and reducing forage quality. Unlike perennial forages, a significant grain component emerges. Grain slightly offsets the decline in fiber digestibility, but not enough to make reasonable lactating dairy forage at this stage.

Forage Yield

Yield is primarily a function of available N. Small grains require 75-100 lbs N/acre to achieve economically acceptable yields. Two tons/acre yield can be expected from a good stand, and well fertilized/manured fields can yield up to 4 tons/acre.

Winter Wheat and Rye

Winter wheat can be grazed in the early spring, and still be harvested for grain or silage. Winter rye is the most winterhardy of the small grains and is typically the most productive for spring pasture, but has lower forage quality compared to wheat.

Spring Oats, Barley or Triticale

Of the spring-seeded small grains, oats and barley are the best options for forage. Barley will be higher in forage quality than oats, as long as it is harvested at a late boot stage and ensiled. Barley is less palatable than oats if stored as hay, due to seed awns. If small grains are used as a companion crop with an alfalfa-grass seeding, care must be taken to use relatively low seeding rates, modest N application, and harvest immediately if lodging occurs. Spring oats can also be seeded in mid-summer for fall forage prior to first frost.

Winter Triticale

More research has been done in NY in recent

decades with winter triticale than any other small grain for forage. Triticale is a cross between wheat and rye, with forage quality somewhat better than either parent. The name combines the scientific names of the parents (*Triticum* and *Secale*). There is essentially no market for the triticale grain in the Northeast.

The crop must be seeded in late August or early September to achieve highest yields. Seeding rate is 100-125 lbs/acre. It is more like wheat than rye, in that it requires consistent seed placement 1-1.5" deep. About 20-40 lbs N/acre can be applied at seeding, but at least 100 lbs N/acre should be applied at spring green-up. Some of the spring N can come from manure, but it will need to be supplemented with commercial N fertilizer.

Intercropping with Small Grains

Winter wheat-hairy vetch mixtures. Quality of wheat forage declines more quickly than that of oats, barley, or triticale. It is possible to grow winter wheat in association with hairy vetch to overcome this problem. The vetch intertwines with the wheat, with the majority of the vetch eventually resting on top of the wheat crop. Intercropping with a legume such as hairy vetch will increase forage CP by 1-2 percentage units, but may not significantly impact yield or digestibility of the forage. Seeding rates are about 95 lbs/acre of wheat and 30 lbs/acre of vetch. Early harvest allows for double cropping.

Spring oat or barley-field pea mixtures. Field peas are intercropped with small grains to improve the quality and palatability of the forage. Yield will not be affected by adding peas. They can be used as a cover crop for establishing alfalfa, with some risk to the perennial seeding under dry conditions, or if the seeding rate of small grain is too high. More often they are an emergency silage crop.

Adding peas to oats or barley increased CP by 2-5 percentage units and reduced NDF by 4-9 percentage units in Wisconsin trials, compared to small grains alone. Seeding rates for oat/pea mixtures are 30-45 lbs oats/acre and approximately four pea seeds per square foot. Field pea seed size varies considerably among varieties. A higher rate of peas will cost more, but not likely to result in additional yield or quality benefits.

Winter triticale-red clover mixtures.

Winter triticale has been sown with red clover in NY. If triticale is harvested at the flag leaf stage (mid-late boot stage), it is possible to get two cuttings of red clover after the triticale is removed. Red clover is notoriously difficult to dry, tedding greatly speeds up drying.

Cover Crops

One advantage of fall-sown small grains is erosion control for highly erosive lands. Soil structure and soil health are improved by having a continuous soil cover, and it is relatively easy to plant small grains with minimum tillage equipment.

Summary

Small grains in a double crop system will provide a cover crop for erosion and potentially yield as well as a full season forage crop. A high level of management will be required to achieve high productivity.

Additional Resources

- 2011 Cornell Guide for Integrated Field Crops Management. Electronically accessible at: <http://ipmguidelines.org/Fieldcrops/>.
- Cherney, J.H. and G.C. Marten. 1982. Small grain crop forage potential. *Crop Sci.* 22:227-231.
- Twidwell, E.K., K.D. Johnson, and J.H. Cherney. 1987. Forage potential of soft red winter wheat-hairy vetch mixtures. *Appl. Ag. Res.* 2:164-169.

Disclaimer

This information sheet reflects the current (and past) authors' best effort to interpret a complex body of scientific research, and to translate this into practical management options. Following the guidance provided in this information sheet does not assure compliance with any applicable law, rule, regulation or standard, or the achievement of particular discharge levels from agricultural land.

For more information



Cornell University
Cooperative Extension

Grass Management Manual
<http://forages.org>

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