

# Cover Crops as an Option for Hay Production

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Use of cover crops as a soil amendment to increase nitrogen and organic matter, while decreasing wind erosion, is a growing practice. Grazing cover crops adds to soil health through onsite nutrient retention. However, when livestock are not available, baling cover crops is an excellent way of preserving them for feedout at a later date. Cover crop hay may also be fed onsite or transported to a poor quality area and grazed there with the goal of increasing nutrient input and soil organic matter.

Typically, a cool-season small grain or a warm-season grass with the addition of a legume can provide a high quality hay product if it is cut at the right quality stage. When using combinations, select forage varieties to match quality yields and choose the time of year for planting to match seasonal forages. A common high-yielding crop mix grown for hay in North Dakota is oats and peas. If conventional varieties are used the question becomes – when should you harvest? Attention must be paid to the crop which matures first, then cut using that as a basis. Doing this, however, may potentially reduce the yield of the other crop.



This problem is somewhat alleviated if forage varieties are used since they are typically later-yielding, allowing you to capture yield and quality. Cut oats in the milk stage and peas in the flat pod stage. Consider a naked oat or hull-less oat variety for increased quality and later maturity for the final baled product. Palatability of the hay will be higher with little or no waste if baled correctly.

In June 2015, an oat-pea hay grown at NDSU Central Grasslands Research and Extension Center was harvested with an estimated yield of 3.5 tons/ac. Crude protein was 12.3%, with energy expressed as total digestible nutrients (TDN) at 59.8%. Oats were in soft dough stage and pea pods were beginning to fill. Even at this later stage, crude protein was adequate for a mature beef cow in lactation and energy was similar to an alfalfa hay cut in early bloom.

Brassicas can be a good addition for a grazing cover crop, but should be avoided when growing for hay as they contain an average of 82% moisture at harvest time. High-moisture crops increase drying time, especially when the swaths are thick and heavy. They also increase the risk of mold in the bale if the hay is being stored outside for a long period of time and conditions are humid.

## Fall-Planted Cover Crops for Late Spring Hay Harvest

Winter-hardy, fall-planted small grains include rye, winter wheat, and triticale. These can provide soil protection and a harvest earlier than a spring sown annual hay crop, thereby providing a better window of moisture for an annual double crop. Research over a six-year period by Steve Zwinger, NDSU agronomist at the Carrington Research Extension Center, showed cereal rye was the first to head at the beginning of June, with an earlier overall maturity

**Table 1.** Annual small grain cover crop hay comparisons.

Crop Type	Spring Stand <sup>1</sup>	Heading Date	Harvest Date	Plant Height	Harvest Moisture	--- Yield <sup>2</sup> ---		Crude Protein <sup>3</sup>	-- Quality Data <sup>3</sup> --			
						15% M	DM		ADF	NDF	TDN	RFV
	%			inch	%	ton/ac	ton/ac	%	%	%	%	%
Wheat	92	June 17	June 24	39	71	3.1	2.6	13.5	36.7	60.0	58.2	93.6
Triticale	67	June 15	June 21	50	77	2.9	2.5	13.6	38.0	61.6	57.6	89.6
Rye	98	June 2	June 12	48	74	3.0	2.5	12.4	33.3	53.2	55.9	85.3

<sup>1</sup> Spring stand - 3-year average, <sup>2</sup> Yield data - 6-year average, <sup>3</sup> Quality data - 2-year average  
Source: Zwinger, Steve. Carrington Research Extension Center Annual Report, 2012

and harvest date 9-12 days earlier than winter wheat or triticale (Table 1). The three hays were all harvested from heading to mid-flower (anthesis). This study indicates a rye harvest would best ensure capture of soil moisture in late-May and

June, allowing for another crop the same year. Yield, protein level, and energy expressed as TDN were similar among the three hays. Triticale had the highest protein at 13.6%, and wheat had the highest TDN at 58.2%.

Additional comparisons among the three cereal grain hays are in Table 2. More detailed information can be found in the NDSU Extension publication “Annual Cover Crop Options for Grazing and Haying in the Northern Plains,” accessible at [www.ag.ndsu.edu/pubs/ansci/range/r1759.pdf](http://www.ag.ndsu.edu/pubs/ansci/range/r1759.pdf).

**Table 2.** Winter cereal trait comparisons for use in cover crop hay.

Winter Cereal Type <sup>1</sup>	Palatability	Forage Production	Allelopathic Effect on Other Crops	Weed Control	Hardiness & Disease Resistance	Cost
Winter wheat	0	0	0	0	0	0
Winter rye	-	+	-	+	+	+
Winter triticale	+	+	0	0	0	-

<sup>1</sup> Symbols represent neutral (0), advantage (+), or disadvantage (-) when comparing cereal types.

Adapted from NDSU Extension publication “Annual Cover Crop Options for Grazing and Haying in the Northern Plains,” R1759

If higher protein content is desired, a fall-seeded legume able to overwinter would be a good option.

Unfortunately, choices are few. Hairy vetch can be utilized, but is difficult to remove if the following crop has a legume. Winter pea can be attempted, but Upper Midwest survival can be erratic.

### **Late-Seeded or Delayed-Seeded Cover Crops for Fall Harvest**

In years of excessive moisture, when a cover crop is viable following a cash crop or seeding of a cover crop is delayed, warm-season grasses can provide additional yields for baled forage. Warm-season legumes, such as soybeans or cowpea, can also be added as a protein boost to the mix. However, care has to be taken to harvest before a frost, as quality of warm-season mixes drops sharply after a frost. Baling prussic acid potential crops, such as sorghum-sudan or sudangrass, instead of grazing them, can alleviate these concerns for livestock, as prussic acid is a volatile compound dissipating in a cured bale.

There are many options for cover crops as baled products for livestock feed. Plans to use these for hay should be made ahead of time, along with flexibility to adapt to whatever weather conditions materialize. Cover crop hay can provide another tool in the toolbox for farmers utilizing cover crops, provided they choose the best forage varieties to fit into their overall farm or ranch operations.