

Winter annual pasture for fall and spring grazing:

A report of an on-farm demonstration

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Winter annuals can provide valuable late-fall and early-spring grazing. Richard Clemmer- a Rockbridge County cattle producer- hosted a winter annual grazing project with Virginia Cooperative Extension, NRCS, and the Chesapeake Bay Foundation from fall 2013 to spring 2014. In this project, an old sod was rotated into winter annual pasture in order to begin the transition back into a perennial grass hay.



Strip grazing oats & rye, stubble in foreground

The following paper details the project as it relates to winter annual selection and establishment, grazing, forage yield and quality, and feed cost savings.

Establishment

Several goals were considered when choosing forage species for winter annual pasture: the desire for a fast-growing component to provide fall forage, the need to maintain a live cover crop over winter, and the desire for early spring forage.

Spring oats and turnips were chosen for their excellent fall growth potential, with the knowledge that both would winterkill. Small grains were chosen for their winterhardness and spring growth potential. Italian ryegrass and crimson clover were also chosen for their spring growth potential, however, severe winter temperatures killed most of the Italian ryegrass. It is important to note that the Italian ryegrass and crimson clover do not produce enough fall growth to graze - the abundant fall growth reported for that mixture was from the oats.

The following species mixtures and rates were no-till drilled into millet stubble on September 1, 2013. 40 lbs./acre of nitrogen was applied at planting.

- 2 bushel (112 lbs.) 'Elbon' forage rye + 3 lbs. 'Appin' turnip
- 1.5 bu. (48 lbs.) 'Jerry' spring oats + 1.5 bu. (84 lbs.) 'Elbon' forage rye
- 1.5 bu. (48 lbs.) 'Jerry' spring oats + 1.5 bu. (84 lbs.) 'VNS' cover crop rye
- 1.5 bu. (48 lbs.) 'Jerry' spring oats + 50 lbs. Thoroughbred barley
- 2 bushel (64 lbs.) 'Jerry' spring oats + 15 lbs. 'Green Spirit' Italian ryegrass blend + 10 lbs. 'VNS' crimson clover

The cost of seed for all mixtures was around \$45/acre; the cost of nitrogen was about \$25/acre.

Oats, 60 days after planting



Fall Grazing- *with early-lactation beef cows and calves*

All mixtures grew enough to begin grazing by 60 days after planting. Plants were grazed to leave a 2-3” stubble in an effort to promote regrowth going into winter (for cover crop purposes) and to support rapid spring growth of overwintering species. Despite some difference in yield among mixtures, it is likely that the difference measured was due to field or sampling variability. As a whole, the mixtures yielded an average of around 2,000 lbs. of forage/acre, mostly comprised of oats or turnips, and to a lesser extent, of small grains. Each acre of winter annual pasture provided fall grazing for the equivalent of about 100,000 lbs. of liveweight for 1 day (for example, 100 head weighing 1,000 lbs. each).



Grazing rye + turnips- Nov 15



Table 1. Fall forage yield and quality of various winter annual pasture mixtures

Mixture	Dry matter yield (lbs./acre)	% TDN (energy)	% Crude protein
'Jerry' oats, 'Green Spirit' Italian ryegrass, 'VNS' crimson clover	2484	81.2	20.0
'Jerry' oats, 'VNS' cover crop rye	1929	82.8	19.5
'Jerry' oats, 'Elbon' forage rye	1865	82.7	19.5
'Jerry' oats, 'Thoroughbred' barley, 'Elbon' forage rye	1492	80.5	17.3
'Elbon' forage rye, 'Appin' turnip	1993	88.8	28.2

Winter annuals are in a vegetative state in fall and early-spring, and therefore are extremely high in nutritive value. Table 1 shows forage quality analyses for the various mixtures in the demonstration, taken just prior to grazing in fall. Forage was about 20 inches tall at the time of sampling.

Table 2. Nutrient needs of beef cattle. (NRC, 1996)

Animal Class	Dry matter intake (lbs./day)	% TDN (energy)	% Crude protein
cow: late gestation	25.0	55.7	8.7
cow: early gestation	27.5	58.7	10.0
first-calf heifer	23.8	61.4	10.7
6 wt. calf (2 lbs. daily gain)	14.4	68.0	12.1
dry cow	24.2	44.9	6.0

Table 2 shows the nutrient needs for different classes of beef cattle. All winter annual mixtures in this project greatly exceeded animal nutrient needs for all classes of beef cattle. For example, the cows in this demonstration were in early lactation during the fall grazing period. The energy requirement at this stage is around 55% of the diet as digestible nutrients (TDN); all winter annual mixtures in fall exceeded 80% TDN.

Several animal health items should be taken into account when grazing winter annuals:

- 1) In the vegetative (fall and early spring) state, winter annuals are usually very high in moisture content. In addition to causing loose manure, it can be difficult for animals to physically consume enough forage to meet daily dry matter requirements. This can be remedied by providing animals with access to a source of dry matter roughage (e.g. stockpiled fescue pasture, corn stalks, hay).
- 2) Brassicas (e.g. turnip, rape, radish) commonly have extremely high levels of protein. Excess protein in the diet must be metabolized and can represent a major energy cost to the animal, potentially causing a loss in body condition.
- 3) Animals grazing brassicas can experience iodine deficiencies caused by goitrogens (which block uptake of iodine by the thyroid). Also; lush, vegetative grasses can be low in calcium and/or magnesium. Be sure to provide free-choice, complete mineral to animals.

Spring Grazing- *with late-lactation beef cows and 5-weight calves*

Due to a hard winter, only the cereal rye survived without significant winter damage. Animals were turned out in mid-April onto rye in the pre-boot stage – around 20” tall. Each acre of rye yielded roughly 4,000 pounds of forage and provided spring grazing for the equivalent of about 160,000 lbs. of animal for 1 day (*for example, 160 head weighing 1,000 lbs. each*).

Table 3 shows forage quality analyses for the rye in the demonstration, taken just prior to grazing in spring. Both types of rye exceeded animal nutrient needs for all classes of beef cattle.

Table 3. Spring forage yield and quality of rye varieties

Mixture	Dry matter yield (lbs./acre)	% TDN (energy)	% Crude protein
'Elbon' forage rye	4052	75.8	17.9
'VNS' cover crop rye	3650	76.2	18.1



Early-spring green-up. 'VNS' cover crop rye on left, certified forage-type rye on right



Feed cost savings

Assuming a hay cost of \$125/ton for 1st cutting orchardgrass, the cost of a pound of digestible energy from hay was anywhere from 2 to 5 times higher than from the winter annual pasture in this demonstration, depending on whether you factor-in grazing in fall, spring, or both.

A savings of about \$1.10/head/day was conservatively calculated for each day animals were grazed rather than fed hay (roughly 60 cow-calf pairs for 57 days ~ \$3,360 in savings). Improvements in cow body condition and calf gains were not measured, but were noted as additional benefits.

Moving fence on oats + rye- November 6



Stubble going into winter



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