

Regional Silage Trial – Pulse Mixtures

Partners: Alberta Agriculture and Forestry
SECAN
Chinook Applied Research Association
West-Central Forage Association
SARDA Crop Research
Battle River Research Organization

Objectives:

1. To determine which pea-cereal mixtures are a feasible option when compared to conventional cereal forage crops for whole-plant forage production, considering both yield and quality.

Background:

The most commonly utilized forage crops are typically monocultures of barley, oats or triticale. Despite this, there are other annuals available that could provide an alternative crop for forage production or to extend the grazing season. The use of corn has significantly increased in recent years as a method of extending the grazing season. The use of alternative annual crops can provide a break in disease from cereal production or as a break in perennial cropping rotation while still providing a forage crop.

The inclusion of peas into the production of an annual cereal crop can provide multiple benefits over the use of a monoculture crop. Fertilizer costs could be reduced due to the ability of peas to fix nitrogen which could also impact overall soil fertility. Peas have a high protein content and will therefore add protein to the overall forage quality.

Method:

The trial was established at the LARA Fort Kent Research Site (NE25-61-5-W4) on May 23, 2017 in a randomized complete block design (RCBD) with four replicates to reduce error. The plots were seeded with the LARA five-row zero-till small plot drill to a depth of 1.5 – 2” to try and reach an intermediate between cereal and pea recommendations. The peas were inoculated prior to seeding.

Cereal monocultures of CDC Baler oats, Taza triticale and CDC Austenson barley were established as check treatments for comparison to the pea/cereal mixtures. The trial was seeded with 9 treatments and each cereal variety was seeded in a mixture with CDC Leroy peas or CDC Meadow peas.

Agronomic information on the trial can be found in table 1. No in-crop herbicide applications were performed for weed control due to the mixture of broadleaf and grassy plants. Therefore, hand-weeding was done where necessary.

The LARA alfalfa-omega self-propelled forage harvester was used to harvest the plots at the recommended cereal harvest date + 10 days. The individual plot weights were recorded and samples were taken to assess dry matter content. An additional composite sample was taken from each variety, frozen and sent to A & L Canada Laboratories for wet chemistry analysis. Statistical analysis of the data was conducted using ARM 9, $p = 0.05$.

The following varieties were used in the pea/cereal trial in 2017:

- *CDC Austenson barley* - 2-row barley variety with semi-smooth awns, short and strong straw and high feed yield.
- *CDC Baler oats* - very leafy, forage oat variety.
- *Taza triticale* – reduced awn forage and grain triticale variety with good lodging resistance.
- *CDC Leroy peas* – high yielding field pea variety with excellent quality.
- *CDC Meadow peas* – consistently high yielding, competitive yellow field pea variety with good lodging resistance.

Table 1. RST Pea/Cereal Mixture Agronomic Information, 2017.

Site	Date Seeded	Date Harvested	Rain (mm)	Treatments	Seeding Rate	Fertility
Fort Kent	23-May-17	18-Aug-17	231.4	Austenson	300 plants/m ²	50 % of recommended rate*
				Baler	300 plants/m ²	50 % of recommended rate*
				Taza	370 plants/m ²	50 % of recommended rate*
				Austenson/Meadow	150 pl/m ² , 57 pl/m ²	50 lbs/acre of 11-52-0-0
				Baler/Meadow	150 pl/m ² , 57 pl/m ²	50 lbs/acre of 11-52-0-0
				Taza/Meadow	185 pl/m ² , 57 pl/m ²	50 lbs/acre of 11-52-0-0
				Austenson/Leroy	150 pl/m ² , 57 pl/m ²	50 lbs/acre of 11-52-0-0
				Baler/Leroy	150 pl/m ² , 57 pl/m ²	50 lbs/acre of 11-52-0-0
				Taza/Leroy	185 pl/m ² , 57 pl/m ²	50 lbs/acre of 11-52-0-0

* 137.5 lbs/acre

Results:

The aim is to harvest the pulse trials at the recommended cereal stage plus 10 days to try and account for the increased moisture content of the forage with the inclusion of peas. In previous years, the trial was harvested at the recommended cereal stage. However, the Forage Pea trials conducted by LARA for four years found that optimal yields and quality could be achieved if harvest was delayed by at least 10 days. The results of the pea-cereal trial are summarized in table 2 and historical data can be found in table 3.

In contrast to previous years, the mixture with barley (CDC Austenson) yielded higher than the monocultures and yielded the highest of the mixture treatments at 4.73 ton/acre. In previous years, the increased biomass typically seen in oat production caused the oat/pea mixtures to out-yield the barley/pea and triticale/pea mixtures. Second to the barley/pea mixture, the second highest yielding mixture was the Taza/CDC Leroy treatment at 3.76 ton/acre. Triticale is known for increased straw strength and reduced lodging, therefore, inclusion with a pea-cereal mixture could help with pea standability and overall ease of harvest. In general, the mixtures with CDC Leroy peas yielded higher than the mixtures with CDC Meadow peas.

The lowest yielding mixture was the Taza/CDC Meadow mixture at 3.19 ton/acre. Triticale tends to have lower leaf biomass production than both oats or barley, which could lead to reduced overall yields in the mixture treatments.

