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Corn for silage in northern Peace region of Alberta

Introduction: Due to being energy dense feed, high yielding and palatable, corn is an excellent forage crop. Corn is also capable of utilizing large amounts of nutrients from soils receiving frequent manure applications, and grow well even in areas that may cause problems for cereal crops. However, intensive management, sufficient soil fertility, adequate water and sufficient heat must be available for a successful corn crop.

Harvesting the crop at the appropriate stage of development is critical to make high quality corn silage, even more so than cereals. Growing conditions must allow the corn to reach the half-milk-line stage of kernel development or yield and quality will be compromised. Research indicates yield reductions of up to 50% when ear (cob and kernel) development does not occur. Higher costs can sometimes be offset through better feed quality but managing to obtain maximum yields remains the best option (www.agric.gov.ab.ca/wfbg7469).

The major risk factor for growing corn in the northern Peace region is the environment. Three year of growing corn by the producer showed well establishment each year but yield varied considerably. Despite a hot summer, the lack of moisture throughout the growing season of 2004 limited crop growth.

Objective: To evaluate the growth and use of different corn varieties for silage under northern Peace conditions in Alberta.

Materials and Methods: The plots were approximately 0.5 mile in length and varied in width from four to twelve rows of corn, depending on the amount of seed available. All corn varieties were seeded on May 8, 2006 with a John Deere four-row corn planter (36" spacing). Seeding rate for each variety was adjusted to 20,000 kernels per acre. Soil tests were used to determine nitrogen rate (60 lbs/ac actual N). After plant emergence, the soil was cultivated with a conventional row-crop cultivator. The discs, four inches apart in width, cut the soil away from the plants and shanks moved the soil back towards the plants.

Samples for plant heights and yield were collected for each plot one week prior to harvest on September 18. A 980 New Holland three-row harvester was used. Silage was trucked away and packed immediately in a pit near the feeding site.

Results and Discussion: The growing conditions were ideal for corn in 2006. An early spring allowed early seeding and all varieties germinated well. Rainfall throughout the growing season attributed to excellent growth of all varieties.

There was a large range in the yield (12.9 to 23.4 tons/ac), plant height (2.36 to 3.11 m), and relative proportion of cob weight (38.5 to 72.3%) for different varieties (Table 1). PickSeed 223 yielded highest but it had lowest height and proportion of cob weight. The 39H84 was the next highest yielding corn. The lowest yielding varieties were 39F45 and 39T67.

The feed quality of the varieties also varied (Table 2). The PickSeed 223, 39M26 and 39A94 tended to have highest protein content and total digestible nutrients (TDN) content while the 39H83, PickSeed 2230 and 39T67 tended to have lowest values of these feed quality parameters. The varieties with higher values of these feed quality parameters could be considered to have better feed quality.

The varieties with higher wet yield, protein, and TDN levels generally tended to have higher dry matter level and lower moisture percentages. This indicated that these varieties were at

advanced growth stage compared to the other varieties and needed shorter growing period for completing different growth stages. However, all tested varieties were considered to have adequate forage potential.

Conclusions: There was a considerable range in the silage yield and quality (protein and TDN contents) of the test varieties. Also there was a wide range in the height, proportion of cob weight, moisture level, and dry matter. These showed that producers must consider many points when deciding to grow a corn variety for silage in the northern Peace area of Alberta.

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Table 1. Seed cost, plant height, silage yield (65% moisture), and cob weight of corn varieties.

Variety	Type	Cost* $/bag	Height m	Wet Yield tons/ac	Cob weight (%)
Pick Seed 223	RR	184	2.36	23.4	38.5
39H84	Conventional	175	2.81	18.1	62.0
39H83	RR	175	3.27	17.0	51.4
39M26	RR	173	2.75	16.5	72.3
39B93	Conventional	NA	2.94	15.5	51.9
39A94	Conventional	140	3.03	15.0	56.7
Pick Seed 2230	Conventional	168	2.50	14.1	61.8
39F45	Conventional	130	2.89	13.1	51.9
39T67	RR	165	3.11	12.9	39.7

* Pick Seed 2230 was treated with Maxim Excel. Other seeds were treated with Pancho.

Table 2. Nutrient content, moisture content and dry matter of corn varieties.

Variety	Type	Protein (%)	ADF (%)	TDN (%)	Moisture (%)	Dry Matter (%)
PickSeed 223	RR	3.0	9.5	24.1	65.3	19.6
39H84	Conv.	3.0	12.0	20.8	67.9	18.2
39H83	RR	2.1	9.1	18.4	72.5	15.5
39M26	RR	3.5	13.0	24.6	62.7	21.1
39B93	Conv.	2.8	12.2	20.8	67.7	18.3
39A94	Conv.	3.2	14.4	23.0	63.9	20.7
PickSeed 2230	Conv.	1.8	6.3	15.7	77.3	12.8
39F45	Conv.	2.8	10.5	21.8	67.6	18.3
39T67	RR	1.8	7.9	14.3	78.2	12.4