AERC Inc.

Agriculture Environmental Renewal Canada Inc.

Canadian Silage Sorghum Hybrid (CHMSH 35)

Sorghum compared to corn:

Better water utilisation efficiency - Sorghum has two-folds bigger root system and half the leaf transpiring area compare to corn. It requires 30 to 50% less water than corn to produce a unit of dry matter.

Dormancy- Sorghum stays dormant during drought stress and recovers with rain, whereas this recovery is not found in corn.

Low cost feed- Silage sorghum requires 70% of corn fertilizer program, no insect control and can be harvested with a regular forage harvester.

Assured feed supply- Perennial forage grasses and silage corn production in Ontario and Quebec is frequently affected by drought. Sorghum being an excellent drought and heat tolerant crop will ensure feed supply even in dry years.

Characteristics of CHMSH 35:

- Recommended for one time harvesting to make silage or green chop for dairy and beef
- Forage dry matter yield of 12- 16 t/ha
- Very leafy and takes 110 to 120 days to reach soft dough stage of grain maturity
- Frost sensitive with safe prussic acid level

AERC's Canadian Silage Sorghum Hybrid 35 was released in 2003. It produces 20% more forage dry matter yields than silage corn, in field trials at Ontario and Quebec.

Research on Adaptability, Agronomy and Utilization of AERC's Silage Sorghum Hybrid is conducted in Partnership with Agriculture and Agri Food Canada, Ontario Ministry of Agriculture and Food, University of Guelph, Agriculture, Pecheries et Alimentation du Quebec and several Private Seed Companies

Table 1: Crop Management Guide- CHMSH 35 Silage Sorghum

Planting date	**Plant in 3rd week of May, when soil temperature is above 12°C with no risk of frost. (Warm soil is needed for rapid emergence and growth).**
Spacing	**Between rows 7 inches and 4 inches apart within the row.**
Seed rate	**9 lbs/acre or 10 kg/hectare. (CHMSH 35 has 40,000 - 45,000 seeds/kg).**
Planting depth	**Plant at 1 inch in good seed bed.**
Population	**Target population 150,000 to 170,000 plants/acre.**
Planting equipment	**Use a grain drill with cereal box. Most corn planters need special sorghum plates or sorghum cups to handle sorghum seed.**
Fertilizer	**Use 70% of corn silage fertilizer based on soil test. Apply 120 lbs N, 30 lbs P and 75 lbs K per acre at planting.**
Grass weed control	**If grass weeds are heavy use Roundup before planting. Cultivation is also an effective option.**
Broad leaf weed control	**Following herbicides are registered for broad leaf control in Ontario. 1) PEAK 75WG plus BANVEL-480, 2) BASAGRAN Forte, 3) 2,4-D. Herbicide should be used at 4- 6 leaves stage. (Follow labels and *guide to weed control).***
Harvest at flag leaf stage	**Harvest at plant moisture (60- 72%) with a regular forage harvester. Chop uniformly and fill the silo as quickly as possible and pack the silage well. Recommended chop length is at ¼ to 3/8 inch.**
Uses	**Silage and green chop.**

Table 2: Forage dry matter yield and Quality of CHMS 35

Parameter	CHMSH 35	Silage Corn
Plant height (cm)	260	180
DMY (kg/ha)	13,580	9,732
CP (% dm)	9.0	8.0
ADF (% dm)	27.7	21.5
NDF (% dm)	49.9	45.3
IVDMD (% dm)	81.1	86.7
NEL (Mcal/kg)	1.54	1.72
TDN (% dm)	67.6	72.8
Ca (% dm)	0.15	0.09
P (% dm)	0.38	0.42

Years tested- South western Ontario- Delhi- 2, Quebec city-1.

Silage Sorghum CHMSH 35: AERC Inc. has developed new silage sorghum hybrids adapted to Ontario and Quebec for single cutting system. Based on initial field trials our first silage hybrid CHMSH 35 was released in 2003. Harvesting at dough stage of grain maximizes total production and optimum quality due to increased energy associated with the grain. Field testing indicated that total dry matter yield of CHMSH 35 is 21% superior to the Silage corn (check) at Harlaka, Quebec and 59% superior to silage corn at Delhi, Ontario. The average forage composition of CHMSH 35 was 9 % crude protein (CP), 28 % acid detergent fiber (ADF) 49.9 % neutral detergent fiber (NDF) and 81 % invitro dry matter digestibility (IVDMD) and a net energy lactation (NEL) of 1.54 (Mcal/kg) across locations (Table 2).

Animal Feeding trials:

Feeding trials with dairy cattle have been conducted at Kemptville College, University of Guelph. The diets were formulated based on NRC (1989) minimum nutrient requirement for 650 Kg cows producing 35 kg of milk with 4.0 milk fat per day. Formulated diets contained 24 % sorghum silage or 24% corn silage and 29 % alfalfa-grass haylage and 31% high moisture ear corn. Sorghum silage had similar fatty acid composition and slightly higher protein than corn Silage (Table 3). Dairy cows with AERC's high moisture sorghum silage had similar dry matter intake, milk yield and milk composition as compared to those on the control diet with corn silage (Table 4).

Table 3: Fatty Acid and Protein Composition of Sorghum Silage and Corn Silage

Parameter (% dry matter)	Sorghum silage	Corn silage
Lactic Acid	5.22	4.34
Acetic Acid	1.32	1.51
Lactic/Acetic Ratio	3.95	2.87
Butyric Acid	0.001	0.001
Total Acids	6.58	5.92
pH as sampled	3.65	3.80
Crude Protein	9.33	8.18
Ammonia, CPE	0.60	0.40
Ammonium-N % of Total N	7.61	4.79

Table 4: Milk production in late lactation dairy cows

Parameter	Sorghum silage	Corn silage
Dry matter intake (kg/day)	25.7 a	26.2 a
Milk production (kg/day)	30.55 a	30.63 a
Milk fat (%)	3.97 a	3.90 a

**Means in the same row with the same letter are not significantly different at P=0.05*