

Grow MasterGraze Corn-a short duration annual forage crop for improving milk and butter fat production

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You may be wondering what is MasterGraze corn! It is short duration forage corn from Masters Choice, Inc., Anna, IL (seedcorn.com) with a brown midrib (BMR) trait. It produces tillers and grew up to 155-160 cm tall at Thunder Bay. It is slow to grow in the first month after seeding and picks up rapid growth during the second month. The crop doesn't produce fully developed ears and can be grazed in midsummer or harvested for silage at tasseling when ears have not emerged (80-90 days after seeding). With staggered seeding, the crop could also be chopped daily and fed green to the cattle. BMR trait in MasterGraze corn results in lower concentrations of lignin in the stems and leaves, which makes its fiber highly digestible. Dense stalks and leaves with an abundance of select sugars provide more energy and nutrition than any other forage crop, which makes MasterGraze palatable and excellent for grazing! Its tillers have regrowth potential after grazing/or cutting at the early stages; in which case inter seeding another forage crop in the MasterGraze stubble could be done to increase forage production. The crop has become popular in the USA and is grown from Florida to North Dakota and west to California.

Recommended seed rate for MasterGraze corn is 40,000 seeds/acre and the crop could be seeded from last week of May to first week of June in the colder areas and up to August in warmer areas; ideally at 15" row spacing. Seed is available from Choice Seeds, Straffordville, Ontario; contact person is Dwayne Weber (Email: dgnweber@gmail.com; Tel: 519-878-3728). It is ready for harvesting on/around August 25 in northwestern Ontario. Last year, we seeded the crop on June 5 and harvested on August 26. In warmer areas, the crop could be harvested in 60 days (dry matter yield of up to 5 MT/acre). Weed control may be done by pre plant incorporation or pre emergence or even early post emergence (up to 2 leaf) application of AAtrex Liquid 480 (<http://www.syngenta.ca/Productsdetail/AAtrex-Liquid-480>). AAtrex can be tank mixed with Dual II Magnum for application at all the aforesaid times and with Dual II Magnum + Callisto for pre/ and early post emergence application. However, we obtained good weed control at TBARS with application of AAtrex alone.

What fertilizers did we apply and what sort of dry matter yield did we get from the crop? We tested MasterGraze corn at varying rates of N from 0 to 200 kg N/ha from urea or urea + ESN in 3:1 ratio on N basis. Averaged over three years (2013-'15), dry matter yield @ 150 kg N/ha from urea was 8,404 kg/ha and that from urea + ESN at the same rate of N was 8,506 kg/ha. Increasing the rate of N from 150 to 200 kg/ha improved the dry matter yield only by ~150 kg/ha and that too only with urea + ESN. However, it may be important to know that the dry matter yield with urea + ESN @ 100 kg/ha (8,385 kg/ha) equaled the dry matter yield with urea @ 150 kg N/ha (8,408 kg/ha). I can see an economic advantage (a net gain of over \$50/ha) of using ESN with urea. Other nutrients were applied as per soil tests. Last year, we had seeded the crop on June 5 and harvested after 82 days on August 26. Averaged over three years, at TBARS MasterGraze corn grown with 150 kg N/ha had a feed value of 14.7 % protein, 29.2 % ADF, 52.5

% NDF, 66.2 % TDN, 1.51 Mcal/kg NEL, 1.39 Mcal/kg NEM, and 1.15 Mcal/kg NEG; RFV was 117. The feed quality with urea + ESN @ 100 kg N/ha was similar to that with urea @ 150 kg N/ha! Dry matter yield, feed quality and RFV of MasterGraze corn was better than that of barley (for silage). Averaged over the same period (3 years; 2013-'15) and in a similar growth duration (83 days), barley dry matter yield at recommended rate of N was 5,852 kg/ha and its feed value was; 10.7 % protein, 39.3 % ADF, 58.1 % NDF, 58.3 % TDN, 1.31 Mcal/kg NEL, 0.68 Mcal/kg NEG, 1.40 Mcal/kg NEM and 93 RFV (see TBARS Annual Report 2015; pages 61-63, 80 and 81)!

Five dairy producers on the outskirts of Calgary, Alberta, taking a clue from research at TBARS, seeded 300 acres under MasterGraze corn in 2015 and they are planning to more than double their acreage (640 acres) this year. Wes Skene a Nutritionist (403-877-3545) in that area told me that seeding was done @ 40,000 seeds/acre during the third week of May; the producers applied 8,000 gallons of liquid manure/acre and no other fertilizers were applied. Weed control was done by Atrazine (Dakota Mix). The crop was harvested at tasseling during the third week of August; at that time ear had emerged. Their average dry matter yield from a 240-270 cm tall crop was 5 MT/acre (please note that their crop duration was two weeks longer than ours and hence higher yield than what we got). Moisture at harvest was 85 %. Producers chopped and ensiled MasterGraze corn at this moisture level in concrete pits with side walls. The leachate kept coming out for 10 days with a total water loss of 3 % in 10 days. As per Skene, the silage didn't freeze in the winter even at -30⁰ C. Increased dry matter intake by milking cows (67 kg corn silage, 3 kg dry grass + alfalfa hay and 11.5 kg supplement) was noticed by feeding MasterGraze corn with resultant increase in milk yield of 3 l/cow in 10 days of feeding; the butter fat went up from 3.93 % to 4.40 %. If the crop is left standing until it reaches full maturity and dries down, it would lodge due to its low-lignin content (weak stems). It could also be baled or chopped after drying to silage moisture levels in windrows, though heavy haying equipment may be required, and the big windrows could take time to dry. Baleage could therefore be challenging.

MasterGraze corn provides good support to twining cowpeas and can therefore be grown mixed with cowpeas to get extra yield and protein and make the forage even more palatable. Cowpeas, being a legume can fix nitrogen and could weather drought better than corn due to its deep taproot system. Ideally, for MasterGraze + Cowpeas mixed system, cowpeas @ 50-60 lbs/acre (~57-68 kg/ha) should be seeded in a perpendicular direction to the corn. AAtrex can't be used for weed control in the mixed cropping system. However, the leafy cowpeas will suppress the weeds obviating the need for herbicide application. Cover crops/or winter cereals for forage or grain production could be a good fit after MasterGraze corn. Unlike winter cereals seeded after barley, there will be no competition from a volunteer crop in the winter cereals seeded after MasterGraze corn. Try growing MasterGraze corn this year!

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