Economic Potential of Grain Sorghum for the Ethanol Market


Goderich Sorghum plot – Aug. 14

Purpose:

Evaluate the yield and economic return of grain sorghum for the ethanol market relative to corn.

Grain sorghum is a drought tolerant, frost sensitive grass crop that has been proposed as a potential crop for the Ontario ethanol market. The crop is indigenous to semi-arid climates of Africa and southern USA (Kansas, Texas, Oklahoma, and Nebraska) but shorter season grain and forage varieties have been developed for Ontario by AERC. The USA produced over 500 million bu. of sorghum in 2007, an increase of 70%. In some states, ethanol based fuel is priced competitive to regular unleaded. In Kansas for example motorists can purchase E85 fuel (85% ethanol) 40 to 60 cents/gal below regular unleaded.

In the USA corn and sorghum can be used interchangeably for ethanol production. The ethanol yield of a bushel of corn is equivalent to a bushel of sorghum. Greenfield Ethanol is evaluating the potential of using grain sorghum in Ontario for ethanol. Testing to date in Ontario has shown the ethanol yield of grain sorghum to be 95 – 98% that of corn. In 2007 Greenfield Ethanol offered production contracts for grain sorghum delivered to its Tiverton location. The contract price was set according to the local price of corn in Bruce County. An incentive of $0.15/bu in addition was offered to offset the added expense of trucking to Tiverton. Feeding trials with hogs and cattle using the distillers' grain from sorghum are currently underway at University of Guelph.

Methods:

Strips of corn and sorghum were planted following recommended practices. Six plots of sorghum were planted the last 2 weeks in May at a seeding rate of 5 -7 lbs/acre in either 35 cm (14 in.) or 75 cm (30 in.) row widths. The 5 plots of corn and one soybean plot were planted at normal planting dates for the area. The sorghum plots were desiccated with glyphosate prior to being harvested in late September – October when seed moisture was near 14%.

Results:

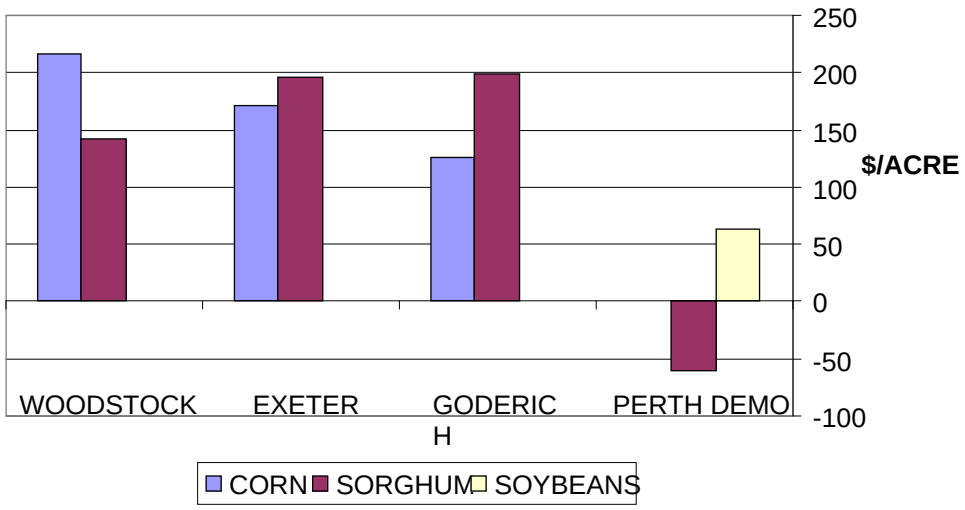
Sorghum emergence was good at 4 locations, but 2 plots were lost due to emergence and/or poor weed control caused by prolonged dry weather. Early growth of the sorghum was slower than the corn and weeds particularly grasses could be very competitive if not controlled early. Few herbicides are registered for use in sorghum, and no post emergent grass control products are available. This was an issue at the Perth demonstration farm, where foxtail that emerged after the sorghum emerged exhibited moderate pressure and likely contributed significantly along with the lack of rainfall to the low yield at this site. The sorghum matured at all sites and was ready for harvest in last 2 weeks of September.

Table 1: 2007 Sorghum Plot Yields (bu./ac)

Location	Yield (bu/ac)		
	Sorghum[2]	Corn	Soybeans
Woodstock	107	168	
Exeter	122	154	
Goderich	123	139	
Perth Demo[1]	50		29

[1] Moderate – high level of foxtail pressure in the sorghum
[2] Sorghum 56 lb/bu.

Figure 1. 2007 CROP NET RETURN



Summary:

This project demonstrated that sorghum may have potential as an alternative grain crop suitable for some soil types or areas of Ontario, but additional field trials will need to be completed to document this. There is a lot to learn in growing sorghum and only one co-

operator had previous experience in growing sorghum. This producer had the best plot with excellent weed control, even stands and harvested the highest yield of sorghum. The ethanol yield from Ontario sorghum and feed value of distillers' grain are under investigation. Options for weed, insect, disease control need to be expanded. Crop insurance is not presently available.

Next Steps:

Weed control is the greatest production challenge, and registration of potential herbicides is to be investigated. The future of sorghum will also depend on its suitability and market price for the ethanol market. Grain sorghum is also being successfully grown and marketed for the birdseed in Ontario and in the USA, types are grown for flour. Crop insurance opportunity is also being pursued.

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Location of Project Final Report:

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