



For1-2011 - Establishment Of C4 Biomass Grasses

CROP ADVANCES

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<http://www.ontariosoilcrop.org/cropadvances.htm>



Establishment Of C4 Biomass Grasses

Purpose:

- To develop agronomic recommendations for the successful establishment of C4 biomass grasses
- To create farmer, public and key stakeholder awareness of the opportunities and economic benefits of the production and marketing of biomass crops in the East Central Region.

Methods:

- co-operative project - East-Central SCIA, University of Guelph & OMAFRA
- 1 X 6 meter plots replicated 4 times (also replicated at Elora).
- treatments include species two (switchgrass, big bluestem), varieties (4 each), seeding rates, seed pre-treatment, nurse crop (spring wheat), P starter fertilizer, and post-emerge herbicides (Estaprop, Achieve).

Results:

Year 1 Observations:

- very significant broadleaf weed pressure on 15% of the plot area appearing to smother grasses
- slight visual injury to switchgrass & big bluestem following herbicide application later in summer - reduced stand counts of switchgrass, but not big bluestem
- varietal differences were observed among switchgrass varieties to herbicide tolerance
- underseeding to spring wheat appears to be a viable management option – harvested at about 60 days as forage, the wheat provided some weed control without the herbicide injury caused by Achieve
- seed pre-conditioning treatment
 - significant increase in germination & stand density for both species - equivalent to doubling the seeding rate
 - combined with the use of starter fertilizer - as effective as tripling the seeding rate
 - starter fertilizer alone had a negligible impact
- big bluestem seed is fluffy and does not flow readily through a seed drill easily which may require a seed coating or other management options such as stirrers in the seed drill box among others.
- demonstration plot at Tom Barrie's, Bowmanville, had considerable volunteer red clover – cutting in the fall for control of the red clover was very detrimental to switchgrass establishment

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Year 2 Observations

- no major changes from Year 1
- broadleaf weeds appear to have had a significant negative effect on establishment on approximately 15% of the plot area
- overall establishment appears positive after the October harvest
- July 2011 seeded demonstration plots (marginal land) at Frank & Julia Hoftyzer's, Hastings. Germination and establishment was excellent, except 1 plot that was planted too deep.

Year 3 Observations:

- Estabrop used for broadleaf weed control at start of growing season
- 50 lbs of N applied when the crop was about 6 inches tall.
- grass growth was **very significant** during summer and fall (5 – 6 feet tall)
- areas of the plot that had significant broadleaf weed pressure in Year 1 (about 15% of the total area) **did not recover**.
- weed control is no longer a problem on the remaining 85% of the plot due to the stand of C4 grasses
- plots were evaluated for stand densities which showed there are variety differences
- seeding rates did not appear to be a significant factor
- spring wheat nurse crop did not improve establishment when evaluated in year 3 following seeding
- switchgrass was more resilient (standability) than big bluestem (wet snow put it down prior to cutting) - switchgrass stood up after snow melted, but the big bluestem did not
- **demonstration plots** - July 2011 20 acres seeded at Frank & Julia Hoftyzer's, Hastings
 - 6 acres had RR soybeans the previous year
 - 14 acres was an old hayfield that was burndowned twice in the spring
 - germination appears good

Raising Awareness - Farmers, Public & Key Stakeholders

- March 2011 - met with key stakeholders (representation from OMAFRA, OSCIA, farmers, economic development, farm equipment dealers, universities, waste management, outdoor furnace and fabricator/developer of biomass burning equipment (East-Central Biomass Working Group)
- August 2011 - bus tour for key stakeholders looked at potential opportunities under development
- Ontario Biomass Tour in October 2011 visited Kinghorn & Hoftyzer plots, and Northern MetalWorks, Sunderland (developing an automatic stoker outdoor furnace capable of burning various types of biomass)
- excellent press coverage

Summary:

- establishment of C4 biomass grasses quite feasible in East-Central Ontario, but can be improved with further research

Next Steps:

- East-Central SCIA maintaining Kinghorn & Hoftyzer plots for further study as a continuing learning experience

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Location of Project Final Report:

www.regionalscia.org

Kinghorn Plots, Cambray - November 2011



significant big bluestem lodging



Hoftzyer Plots, Hastings



No-till establishment on marginal land