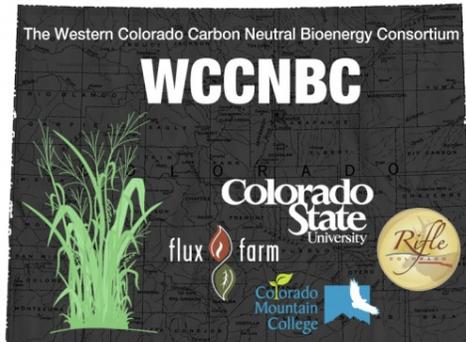




October 25th, 2010

STATUS UPDATE: Evaluation of Perennial Plant Species and Production Inputs for Sustainable Biomass and Bioenergy Production in Western Colorado



The Western Colorado Carbon Neutral Bioenergy Consortium (WCCNBC), a partnership between Colorado State University (CSU), Colorado Mountain College (CMC), The City of Rifle, and Flux Farm Foundation, was formed to determine the ability of the region to produce and process biomass for biofuels and carbon sequestration. This interdisciplinary, applied science, research consortium seeks to collect both quantitative and qualitative data on the costs and benefits of land transition, agronomic analysis of high-biomass producing perennial crops, field analysis of carbon sequestration potential, laboratory and pilot-scale analysis of the conversion of biomass to biofuels such as ethanol, butanol, and synthesis gas, and an economic analysis of the feasibility of Western Colorado growers to produce and market carbon neutral biofuels.

In 2009, Flux Farm Foundation received \$50,000 from the Colorado Department of Agriculture's Advancing Colorado's Renewable Energy (ACRE) program to conduct the WCCNBC's first study - *"Evaluation of Perennial Plant Species and Production Inputs for Sustainable Biomass and Bioenergy Production in Western Colorado"*. Along with an additional \$25,000 in contributions, this phase of research focuses on the capacity of the region to grow low-input, hi-biomass, cellulosic perennial bioenergy crops, with agronomic research occurring at three locations (Carbondale, Rifle, and Fruita, Colorado). Biomass crops are in the process of being converted to ethanol and butanol at Colorado Mountain College's West Garfield Campus in Rifle, representing one of the state's first bioenergy processing facilities housed at a community college.

The following is a summary of our research progress to date relating to the 2009-ACRE grant award.

a. Work completed to date and any relevant findings

The following is a pectoral review of our progress to date. Field trials have been established, growth data is now being collected, and two field days have been held.

Field preparation and planting at Flying Dog Ranch in Carbondale



Soil sampling for carbon sequestration analysis



Cacti collection outside of Gateway, Colorado with BLM Cacti Collection Permit and help from the Chinle Cactus Club



Both individual cacti pads and whole cacti plants were collected



Opuntia cacti at planting



Opuntia cacti in August (only 2.5 months of growth!)



Website construction www.wccnbc.org

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Collaborators

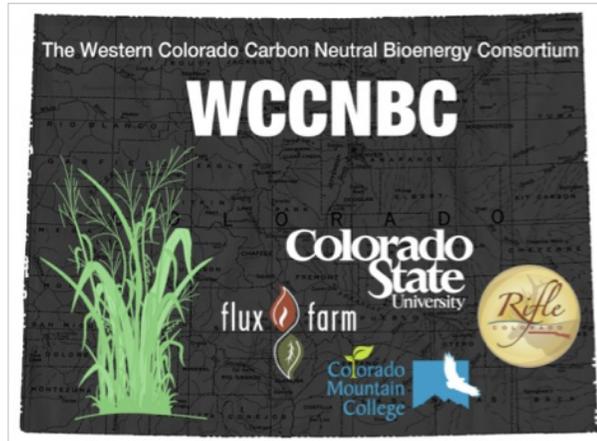
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Investigating the future of bioenergy and carbon sequestration in western Colorado

Fall field day at The CSU Research Center in Fruita



First harvest (Fruita)



Relevant newspaper coverage:

Carbondale non-profit plants seeds for biofuels future (6/17/10 – The Aspen Times)
<http://www.aspentimes.com/article/20100617/NEWS/100619853&parentprofile=search>

Rifle about to see a new energy industry (3/30/2010 – Glenwood Post Independent)
<http://www.postindependent.com/article/20100330/VALLEYNEWS/100329864/-1/RSS>

Carbondale on renewable energy frontier (3/24/2010 – Glenwood Post Independent)
<http://www.postindependent.com/article/20100324/VALLEYNEWS/100329944/1083&ParentProfile=1074>

b. Progress toward expected outcomes

Significant, and expected progress has been made. Field trials have been established, and the process equipment is nearing completion. We expect to begin turning our biomass into biofuels beginning in early 2011.

A 5-year USDA research project has also been developed and submitted for funding: Developing Low-Input, High-Biomass, Perennial Cropping Systems To Support a Bioenergy Economy on Marginal Land in the Intermountain West. We have used ACRE funds as leverage to pursue industry partnerships, educational outreach, and additional program funding.

c. Preliminary findings and/or key accomplishments to date

The following four crop entries have been established along with five opuntia varieties:

Native grass mixture – ‘Magnar’ Great Basin Wildrye, ‘San Luis’ slender wheatgrass, ‘Secar’ bluebunch wheatgrass, ‘Rosana’ western wheatgrass.

Switchgrass mix – ‘Dacotah’ and ‘Blackwell’

Tall fescue – ‘Fawn’

Introduced pasture mix – ‘Cache’ meadow brome, ‘Fawn’ tall fescue, ‘Latar’, ‘Potomac’, ‘Paiute’ orchardgrass, alfalfa.

We have determined that the above selection of grasses can be established in western Colorado, and will monitor re-emergence in spring to document if winter-kill is an issue with any cultivars.

The need for irrigation and weed suppression (mechanical or chemical) remains during the crop establishment period. We are looking into fall plantings of biomass crops developed by the USDA-ARS Forage and Range Research center in Logan, Utah, that will not require supplemental irrigation and excessive weed control and improve the overall efficiency of the production system. These selectively bread grasses will be planted in several locations throughout the region beginning next fall.

Crop yield data is forthcoming.

d. Problems being encountered and/or mitigating circumstances

Problems with weed pressure and small pest disturbance were encountered at the Carbondale growth location. After careful review, it was determined that the stand was too uneven to produce any reliable growth data. We decided to apply a broad-spectrum herbicide to the plots, and disk, effectively ending the first year of growth at the Carbondale location. We will re-plant the Carbondale location in early spring 2011, and follow an active weed and rodent management regime as suggested by the USDA-ARS.

e. Next steps

Refine processing equipment, and begin processing biomass bales harvested during fall 2010 into biofuels at CMC West Garfield campus this winter.

Test biofuels in City of Rifle vehicles.

Re-plant biomass trials in Carbondale in Spring 2011.

Monitor for winter-kill.

Continue to educate local constituents of our progress.

Continue to pursue larger funding opportunities.

f. Any anticipated changes to the project timeline.

None anticipated at this time.

We thank the Colorado Department of Agriculture for the funding to pursue low input biomass growth for bioenergy production in western Colorado, and look forward to sharing more results from our work as the project progresses. For more information about our efforts, please see www.wccnbc.org and www.fluxfarm.com.



Morgan Williams
Executive Director
Flux Farm Foundation