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U.S. Department
of Transportation



Title: *Developing Low-Input, High-Biomass, Perennial Cropping Systems to Support a Bioenergy Economy on Marginal Land at Higher Elevations*

DR. Calvin Pearson

Project Goal

The goal of the research project is to develop a sustainable high yield, low inputs (e.g. fertilizer, pesticides), and environmentally enhancing] biomass crop production system using adapted grasses that do not compete with food crops.

The project objectives of this project were to:

- 1) Evaluate grasses and legume species as single and mixed specie plantings and production input levels to identify those that are productive and profitable for biomass in this region.
- 2) Assess carbon and nutrient cycling, carbon budgeting, and carbon sequestration in a biomass cropping system.
- 3) Perform economic, energy, and life-cycle analyses of the treatment variables to identify a sustainable biomass production system for the region. 4) Conduct outreach, public education, and technology transfer regarding biomass crop production.

Project Outcomes

- Field performance of four grass and grass/legume mixtures: 1) Native grass mixture ('Magnar' Great Basin Wildrye, 'San Luis' slender wheatgrass, 'Secar' bluebunch wheatgrass, 'Rosana' western wheatgrass); 2) Switchgrass mix ('Dacotah' and 'Blackwell'); 3) Tall fescue ('Fawn'); and 4) Introduced pasture mix ('Cache' meadow brome, 'Fawn' tall fescue, 'Latar', 'Potomac', 'Paiute' orchardgrass, alfalfa) and four input levels (none/limited, sustainable, low and high commercial inputs) were evaluated to assess their effect on biomass production over a multi-year testing period beginning 2011.
- Extensive soil and agronomic field data at three locations –Fruita, Rifle, and Meeker, CO were collected beginning in 2011.
- The biomass budget generator that provides a valuable economic tool for producers and others when evaluating the potential to grow various grasses as biomass in the Intermountain West was developed. The biomass budget generator is available to the general public and was specifically made readily available to Extension personnel.



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