

STEEP PROGRESS REPORT

RESEARCH PROJECT TITLE: Identifying Alternate Rotation Crops for Eastern Oregon

INVESTIGATORS:

Stephen Machado, OSU Agronomist, Pendleton

INTERIM OR FINAL REPORT: Interim

PROJECT OBJECTIVES:

1. Obtain alternate crop seed from areas with similar climate to eastern Oregon and from breeders at OSU, WSU and UI.
2. Evaluate the adaptability of alternate crops to growing conditions in eastern Oregon
3. Establish basic agronomic practices of commercially promising alternate crops under reduced tillage systems.

KEYWORDS: Alternate crops, rotation

STATEMENT OF PROBLEM: Detrimental effects of the wheat/fallow rotation can be alleviated by the introduction of alternate crops that reduce or replace the fallow.

Research is needed to screen and evaluate alternate crops such as chickpeas, winter pea, lentil, faba beans, sunflowers, safflower, soybean, millets, buckwheat, linola, grasses, and other crops with industrial and pharmaceutical uses. These crops have been tried before and screening of some of these crops dates back to the 1930s. However, the screening had problems with stand establishment, agronomy, and other problems associated with vernalization and day-length requirements of some of the crops. Given the improvement in germplasm and the agronomy over the years, it is worthwhile to have another round of screening in eastern Oregon. Benefits of these crops to wheat-based rotations are not fully known and research should be done to obtain this information.

AGRONOMIC ZONE OF INTEREST: Research will be targeted for Agronomic zones 3 and 5.

ABSTRACT OF RESEARCH FINDINGS:

Seeds of 76 lines of chickpeas (mostly *desi*-small seeded), 24 lines of lentil, and 8 lines of faba beans have been obtained from the Legume International Nursery, ICARDA, Syria and have been planted (Fall, 2002). Six *kabuli*-large seeded chickpeas were also obtained locally and will be planted in the spring of 2003. Four varieties of lentils and two lines of winter peas that were obtained from the USDA-ARS legume breeding at WSU, Pullman, Washington have also been planted. Varieties of sunflowers, safflower, millets, buckwheat, and linola were obtained from WSU Experiment station, Lind. These crops will be planted in the spring of 2003. Indian Rice grass and needle grasses were obtained from the Amazing Grains Coop in Montana and were planted in the fall of 2001 and

spring of 2002. *Euphobia* was obtained from Southern Oregon Research & Extension Center, Central Point, Oregon and will be planted this spring. More alternate crops from areas similar in climate to Oregon have been requested.

RESULTS AND INTERPRETATION

Evaluation of alternate crops is underway and there are no yield data available for discussion. Seeds of 76 lines of chickpeas (mostly *desi*-small seeded), 24 lines of lentil, and 8 lines of faba beans have been obtained from the Legume International Nursery, ICARDA, Syria and have been planted (Fall, 2002). Six *kabuli*-large seeded chickpeas were also obtained locally and will be planted in the spring of 2003. The variety Sinaloa was obtained from Pendleton Grain Growers and Dwelley, Evans, Myles (*desi*), Sanford, Sierra, and CA9990I604W from Blue Mountain Seed Inc., Walla Walla, WA. Four varieties of lentils and two lines of winter peas that were obtained from the USDA-ARS legume breeding at WSU, Pullman, WA have also been planted. Varieties of sunflowers, safflower, millets, buckwheat, and linola were obtained from WSU Experiment station, Lind. These crops will be planted in the spring of 2003. Indian Rice grass and needle grasses were obtained from the Amazing Grains Coop in Montana and were planted in the fall of 2001 and spring of 2002. *Euphobia lagascae* was obtained from Southern Oregon Research & Extension Center, Central Point, Oregon and will be planted this spring. More alternate crops from areas similar in climate to Oregon have been requested.

Uses of alternate crops in brief:

Kabuli type chickpeas are of high value and are used as an ingredient in salad bars in North America. The low value *desi* types are consumed mostly on the Indian continent, which is a potential market if production is expanded. Lentils are an important food source and like chickpeas, have potential markets in the near east, northern Africa and the Indian subcontinent. Faba beans are used for both human and animal consumption and do not contain any toxins. Winter peas can be harvested for seed, combined with winter cereals for silage production, grown for green manure to restore depleted soil organic matter or combined with winter cereals for harvesting as a multiple seed crop. Sunflower oil is used for cooking, margarine, salad dressings, lubrication, soaps, drying oils in paints and varnishes, and illumination. Safflower is grown for edible oil (high linoleic acid), meal, or whole seed for dairy cattle, birdseed, and oil for industrial uses. Millets are primarily grown for birdseed and forage. Japan is the major importer of buckwheat where the flour (high in lysine) is combined with wheat flour to prepare buckwheat noodles (soba), a traditional dish. Buckwheat also can be grown as a green manure crop, companion crop, cover crop, and as a source of dark buckwheat honey. Linola is grown for edible oil (low in linolenic acid), industrial oil, and for fiber that is used to make linen, toweling, matting, rugs, twines, canvas, bags, and quality papers (currency notes). The Indian ricegrass and green needle grass are grown gluten free flour for people with celiac disease (gluten intolerant people).

INTERACTION WITH OTHER SCIENTISTS CONDUCTING RELATED

ACTIVITIES: The PI is cooperating with: Brian Tuck, Wasco County Extension Agent, OSU, Sandy Macnab, Sherman County Extension Agent, OSU, Jordan Maley, Gilliam

County Extension Agent, OSU on evaluating alternate crops in eastern Oregon; ICARDA scientists on the Legume International Nursery, Syria.

PUBLICATIONS AND PRESENTATIONS:

No publications have been prepared from this project yet

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