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## Effect of Various Nitrogen and Water Application Rates to Safflower Yield and Oil Concentration

A.N. HANG, DEPT. OF CROP AND SOIL SCIENCES, WSU AND H.P. COLLINS, USDA-ARS VEGETABLE AND FORAGE CROPS RESEARCH LABORATORY, PROSSER, WA

An experiment was conducted using high oleic safflower varieties CW99 OL and S345 on sandy soil at Paterson on April 18, 2008. Seeds were planted on a quarter of a circle at the rate of 25 lbs per acre. P and K were applied preplant at 50 and 75 lbs per acre, respectively. Two irrigation treatments were applied at 70 and 90% evapo-transpiration (ET) using overhead sprinkler. Water application was based on evaporation of the previous day at the same location. Two rates of N were applied at 4 equal portions at 4 stages of plant growth [at seedling stage-2 weeks after planting (WAP); at vegetative stage – 4WAP; at reproductive stage – 6WAP; and at seed fill – 8WAP] for 100 lbs N /a and 25, 40, 40, 40 lbs of N/a at these stages of growth for treatment 2 (150 lbs N/a). At low N and low irrigation, safflower plants set blooms and set seeds earlier than at higher rate. Safflower was mature and ready to be direct combining at 5 months after planting. S345 produced slightly higher seed yield than CW99 OL. Both lines produced higher seed yield and higher oil concentration at low rates of N and water applied. CW99 OL produced an average of 3250 lbs/a with 39.7% oil at 70% ET and 100 lbs N/a compared to 3084 lbs of seed containing 34.3% oil at 90% ET and 150 lbs N/a. S345 yielded 3557 lbs/a containing 40.2% oil at low rates of N and water applications compared to 3017 lbs seed of 37% oil at high rates of N and water applications. Seed moisture was about 6-7%.



## Preliminary Trial of Flax for Seed Production in Washington

A.N. HANG, DEPT. OF CROP AND SOIL SCIENCES, WSU-PROSSER

Flax (*Linum usitatissimum*) is a very old crop with multiple uses. Flax is grown for oil in its seed and fiber in its stem. There are 2 types of flax; seed flax for the oil in its seed and fiber flax for the fiber in its stem. Seed flax is grown to 24 to 36 inches while fiber flax is about 40 inches. Flax seed is crushed for linseed oil and linseed meal. Linseed oil has many industrial uses; linseed meal is used for livestock feed. The fiber in seed flax is used to make fine paper or padding in furniture.

Human consumption of flax seed is increased rapidly for its high dietary fiber, its omega-3 oils and anti-carcinogenic ligands. Flax seed contains high percent of omega-3 fatty acid (50+ %) among oilseed crops grown in Northern America. Whole or crushed seed flax is consumed mostly in bakery products.

Twenty five flax seed lines were grown on Shano silt loam soil at WSU-Othello in 2008. Flax was seeded at the rate of 3 lbs/a in a completely randomized plot with 4 replications. Seedbed containing a residual 77 lbs N/a, 20 ppm P, 345 ppm K, and 17 ppm S and no fertilizer was added. Spartan was sprayed for weed control. Yields varied from 1720 to 2870 lbs/a at 5% seed moisture (25 lines). Three commercial varieties Bethune, Omega and Pembina were planted on sandy soil. Their average yield was 2295 lbs/a. Flax grown on sandy soil did not sacrifice yield lost as canola or safflower but its omega-3 oils was slightly lower than those of the same lines grown on silt loam soil.