Influence of Plant Spacing and Flower Position on Oil Content of Safflower, *Carthamus tinctorius*

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PROGENIES of safflower selections which have produced seed with a high percentage of oil have failed frequently to exhibit this desired characteristic in the next generation. The method of sampling seed for oil content determination was considered to be a possible cause.

Variation in chemical composition of seed of safflower attributed to environmental factors has been noted in variety trials and cultural experiments. In Nebraska, oil percentage of safflower seed varies considerably with available moisture, date and rate of planting and other factors. Oil content of seed from individual plants spaced differently might be expected to vary.

Oil content of soybean seed was reported by Collins and Carter to vary with the position of the pod on the plant, with the position of the pod on the raceme, and with the position of the seed in the pod. Because of procedures used in sampling for oil content in safflower, such differences in oil content of seed due to place of origin on the plant might lead to erroneous conclusions about the genetic potential of individual plants.

The procedure used at Nebraska to select safflower progeny with high oil content for advancement to subsequent generations has been to obtain self-pollinated seed from several flower heads isolated by covering with a muslin bag. Seed from the remaining open-pollinated flowers was harvested for oil determinations and other evaluations. Stands obtained from self-pollinated seed frequently are not uniform; consequently, plants are spaced differently in various progeny rows.

The larger primary and secondary flowers (primary flowers produced on secondary branches) produce a larger number of seeds per flower and are usually chosen for self-pollination. Plants grown close together produce a relatively small number of seed heads from secondary and later flowers than when plants are spaced further apart. The removal of the larger primary or secondary heads from closely spaced plants for self-pollinated seed leaves a smaller percentage of seed heads from the large early flowers as compared to widely spaced plants. Consequently, the seed samples used for oil determination may differ in composition in regard to place of origin on the plant.

Variation in oil content of the seed from various positions on plants grown at different plant spacings was studied to determine whether procedures for sampling seed for oil content resulted in adequate estimates of the genetic potential of the individual plant.

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