

Anchulee Kotcha 2006: Improvement of Spineless Safflower by Gamma Rays for Earliness and High Oil Content. Master of Science (Agriculture), Major Field: Agronomy, Department of Agronomy. Thesis Advisor: Associate Professor Wasana Wongyai, D.Agr. 78 pages.
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Improvement of safflower by gamma rays is one of the promising way to obtain the higher yield and desirable traits. Three doses of gamma rays at 300, 450 and 600 Gy were used to induced seeds of 5 spineless and 2 spine safflower lines. The investigation on mutant characters of six M_2 populations were found that spine safflower plants occurred in four M_2 populations from spineless lines. And two M_2 populations from spine safflower lines gave mutant spineless plants. The mutant characters of smooth seed hull were found in all populations. They were brown striped hull, brown hull and white hull with pappus. The flower color was mutated from orange – red to yellow – orange, yellow and orange.

Pedigree selection was employed in M_2 generation and in successive generations. Selection based on a shorter flowering period and early maturity, plant with narrow angle branches and orange – red flower color. Selected M_4 lines of 33 spineless and 10 spine safflower were tested for their yielding ability in the strip test design with 2 replications. Four spineless safflower lines gave higher yield than the check variety, Phantong (195 kg/rai). They gave yield at 310, 253, 203 and 203 kg/rai in M4015, M4002, M4018 and M4070 respectively. The M_4 lines, M005, M4013, M4048 and M4028 had shorter flowering period and early maturity. Its ranged 24 – 43 days for flowering period and 122 – 124 days for maturity. Most of selected M_4 lines gave higher 1,000 seed weight than the check.

The selected nineteen M_4 lines gave oil content range 16.83 – 26.76 percent. Only one line, M4020 gave nearly value of oil content with the check variety (26.30 percent). Oil percentage gave negative correlation with 1,000 seed weight and seed hull thickness. The results suggest that these two characters might be use as indirect selection for seed oil content in safflower.

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