

Abstract

The objectives of this study were to research and develop inbred lines of hemp. There were 2 experiments consist of; (1) production and evaluation of S₄ lines (2) Evaluation of combining ability of S₄ lines. For Experiment 1, 150 S₄ lines were sown. The S₄ generation showed large range of segregation in all agronomic characters. Large range phenotypic diversity were found, both within and between lines. Significant positive correlation coefficients were found between all agronomic characters, including plant height, stem diameter, number of nodes and branches per plant, total dry weight and seed dry weight, except fiber content. Fifty six S₅ lines were selected and sown. The S₅ generation also confirmed the large range of segregation with high phenotypic diversities, both within and between lines in all agronomic characters. Most lines had THC below the 0.3% threshold and CBD:THC higher than 2.

For Experiment 2, crosses between 46 selected S₄ lines and RPF3 tester were made and F₁ hybrids evaluated. The F₁ were superior to their parents in all characters. Significant positive correlation coefficients were found between all agronomic characters except fiber content. Stem diameter showed the highest correlation coefficients with all agronomic traits and therefore could be used as indirect selection index. S₄ lines from 1) were selected based on the performance of their F₁ top cross and the S₅ seeds will be used in the next generation.