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轮回选择创新高蛋白质含量大豆种质资源

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摘要: 以蛋白质含量较高的D95-753-754、克辐9807-2、黑生101、克辐05-1480为亲本材料，在田间先以产量性状、农艺性状为主要指标优先择优，在室内再以蛋白质含量为指标进行二次择优的选择方法，主要经过二轮杂交、选择和鉴定，逐轮进行蛋白质含量、熟期、百粒重等农艺、产量、品质性状的协同优化，实现了这些性状的同步改良；各轮次育成的品系蛋白质含量不断提高，与主栽品种的产量差距不断缩小，提高了育成的新种质克交11-1615和克交11-1669的育种利用价值。在研究的过程中，坚持不同育种方法获得的中间材料和每一轮次杂交优选出的中间材料的持续利用，聚合了不同来源亲本高蛋白基因；利用基因的加性效应，部分组合实现了超亲遗传。创新了高蛋白育种方法和选择策略。选育出了生育日数115 d（克山）、蛋白质含量16.5%（高于多个亲本）、百粒重 19 g大豆新品种质克交11-1615和生育日数105 d（克山）、蛋白质含量44.5%、百粒重 20 g的大豆新种质克交11-1669。

Abstract: In this study, high protein content materials D95-753-754, Kefu 9807-2, Heisheng 101 and Kefu 05-1480 were used as parents and made staged polymerization hybridization and pedigree selection.We firstly chose yield and agronomic traits as the main index priority to merit in the field, then protein content as indexes for quadratic optimal choice indoors again, final election of stable strain was conducted in F_5 generation. We selected the middle matreials which had high-yield, good agronomic traits high protein content among them, and hybridized with other parents after an appraisal of selected strains.Three rounds of hybridization, selection and identification were conducted mainly: In the first round of the Kejiao 88513-2 （♀）×D95 ?753-754 （♂） we bred Kejiao 20.6588 which overcame the disadvantages of the female parent which had the traits of green seed, branchs, lodging and so on.The growth days of Kejiao 20-6588 was 14 d earlier than D95 -753-754, its 100 -seed weight was increased by 3.5 g and its plant height reduced 25 cm comparing with the male parent. Its protein content was 44.2%, but the yield decreased by 23.21% than contrast varieties of Beifeng 9. In the second round of the Kefu 9807.2（♀）× Kejiao 20.6588（♂） we bred Kejiao 07-5701, the protein content of which was 45.2%.Its 100-seed weight was 4.7 g higher than the male parent, but the yield decreased by 11.7% than contrast varieties of Beifeng 9. In the third round of the first hybridized combination of Heisheng 101 （♀）× Kejiao 07-5071（♂） we bred Kejiao11-1615, which protein content was 46.5%.Its 100-seed weight was 19 g, the average yield of two years decreased by 6.29% than varieties of Fengshou 25.The growth days of Kejiao 11-1615 was 116 d (in Keshan, the third accumulated temperature zone in Heilongjiang province). In the third round of the second hybridized combination of Kefu 05-1480（♀）× Kejiao 07-5071（♂） we bred Kejiao11 -11669, the protein content of which was 44.5%. Its 100-seed weight was 20 g, the average yield -decreased by

10.95% than contrast varieties of Heihe 43. The growth days of Kejiao11-1669 was 105 d (in Keshan, the third accumulated temperature zone in Heilongjiang province). During three rounds of improvement, the high protein germplasm was polymerized and the collaborative optimization of protein content, early-mature, 100-seed weight yield and other agronomic traits was conducted at the same time. In every rounds, protein content of the bred strains was increased in comparison with the one parent or two parents of it and the yield gap with the main variety cultivated in adapting area was narrowed. The breeding utilization value of new germplasm Kejiao11-1615 and Kjiao11-1669 bred was improved. In the process of breeding, by use of materials from different breeding methods and sustainable use of the middle materials improved each rounds, protein genes from different parents was polymerizated and the ransgressive inheritance was achieved with gene additive effect. The high protein breeding and selection strategy was innovated.

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