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摘要: 在大豆高产试验示范与配套技术研究的基础上，分析大豆诸多形态性状与产量的关系，找出对产量影响较大的性状因子，为高产育种、高产栽培提供理论依据。利用生产上运用的3个主栽大豆品种、4种施肥模式与用量、正常生产田密度条件下产生的形态指标及产量差异，分析了大豆植株形态性状指标的主成分，结合产量相关性分析，从中找出产量的主导因子。结果表明，在大豆植株18个农艺和产量性状中，4粒荚数和分枝数变异系数最大，分别为70.15%和68.71%。认为通过更换品种、改善施肥等栽培措施，这些性状具有较大的改进余地，也可以作为育种选择的性状；而百粒重、主茎节数、每荚粒数和经济系数变异较小，其系数仅在3.82%~7.36%之间，改进余地较小；株高、结荚部位、有效荚数等其它性状变异中等，变异系数在11.54%~24.69%之间，也有一定的改进余地。产量与单株粒数、地上干重、有效荚数、3粒荚数、4粒荚数、每荚粒数、百粒重、经济系数都呈极显著的正相关。将大豆植株18个性状指标通过SAS统计软件进行主成分分析，结果表明，这些性状可归纳为产量性状因子、株高性状因子、荚数性状因子和主茎节数性状因子等4个综合指标。这4个主成分累积贡献率达到86.85%，基本可以反映大豆在正常密度条件下，植株的生长和产量状况。育种上需加强生物量大、3粒荚和4粒荚数多、结荚节位低的性状选择；栽培上需注重采取相应的促进生物量增长、降低结荚节位的促控措施。

Abstract: This paper aimed at determining relations of morphological traits and yield, finding out the critical traits in answer to yield under the background of high-yield experiment and demonstration and accessional technologies in soybean, and supplied with the theoretic basis for high-yield breeding and cultivation. Three broadly used soybean varieties, 4 fertilization modes and dosages were involved in this study. Principal component analysis of morphological traits along with correlation analysis of these traits and yield were carried out to determine the leading factors influencing yield according to the variations of morphological traits and yield grown in routine planting density. The results showed that there existed the largest variations for number of four-seed pod and branch number among all traits measured, whose variation coefficient (CV) was 70.15% and 68.71% respectively, implying that they were affected considerablely by such measures as variety replacing and fertilization reforming etc. and exhibited good betterment potential, and also acted as an important trait to select in breeding. As compared, the CV of 100-seed weight, node number of main stem, grain number per pod and economical coefficient were-very-low (3.82% to 7.36%), and provided with less betterment potential. For the other traits, plant height, height of lowest pod, numbers of effective pod and so on, possessed moderate betterment potential with the variation coefficients fluctuating from 11.54% to 24.69%. The results of correlation analysis also indicated that yield correlated significantly positively with grain number per plant, shoot dry weight, effective pod number, three-seed pod number, four-seed pod number, seed number per pod, 100-seed weight and economical coefficient. The results of principal component analysis of 18 traits suggested that these traits might be reduced into 4 comprehensive indexes (yield factor, plant height factor, pod number factor and node number factor of main stem), whose cumulative contribution rate accounted for 86.85%, reflecting basically the growth and yield status of soybean grown in the routine density. It is concluded that selection of traits with high biomass, more three-seed pod, four-seed pod and low node site of podding should be emphasized in breeding, and corresponding regulation measures to enhance biomass and reduce node site of podding should also be adopted in cultivation.

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