

不同品种紫花苜蓿产量性状分析及其综合评价

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摘 要:【目的】对来自国内外的 19 个紫花苜蓿 (*Medicago sativa* L.) 品种在初花期与产量性状相关的表型指标进行系统评价, 为筛选高产优质适生紫花苜蓿品种提供参考。【方法】以在北京市昌平基地种植的 19 个紫花苜蓿品种为材料, 测定了每个品种的株高、分枝数、分蘖数、干/鲜重、茎粗、叶长、叶宽、叶面积、茎叶比等 12 个主要产量性状指标, 利用相关性分析、主成分分析、隶属函数等方法进行了综合评价。【结果】1) 在产量性状上, 紫花苜蓿不同品种间存在较大差异, 茎粗的变异系数最小为 13.43%, 干重变异系数最大为 57.41%; 2) 相关性分析结果显示, 紫花苜蓿的株高与茎粗、茎叶比、干/鲜重之间均呈现出显著性 ($p<0.05$), 表明株高与茎粗、茎叶比、干/鲜重之间存在显著正相关; 3) 主成分分析结果显示, 3 个主成分因子对紫花苜蓿产量具有较强代表性, 其贡献率分别为 37.404%、30.246%和 15.133%, 每个主成分的特征值大于 1, 累计贡献率为 82.783%; 其中, 第 1 主成分中茎粗、株高、鲜重的特征向量占比较大; 第 2 主成分中三叶面积、单叶面积、单叶长、单叶宽占有较大比重; 第 3 主成分中分蘖数、干/鲜重特征向量较大。【结论】结合隶属函数法进行综合分析可知, 紫花苜蓿 ‘阿罗拉’、‘218TR’、‘肇东苜蓿’ 表现最优, 可作为优良品种在进行推广应用。

关键词: 紫花苜蓿; 产量性状; 综合评价

Analysis of yield traits of different cultivated varieties of alfalfa and their comprehensive evaluation

Abstract: 【Objective】The study evaluates phenotypic indicators related to yield traits of 19 domestic and foreign alfalfa (*Medicago sativa* L.) cultivars at the initial flowering stage, and provides a reference for screening the high-yielding, nutritious and adaptable alfalfa cultivars. 【Method】19 different cultivated varieties of alfalfa grown in Changping, Beijing were used as tested materials, and 12 major yield traits were determined, including the plant height, the number of branches and tillers, the dry/fresh weight, the stem thickness, the leaf length/width/area, and the stem-leaf ratio, and were comprehensively evaluated by the correlation analysis, principal component analysis and affiliation function. 【Result】1) In terms of yield traits, there were large differences among different alfalfa cultivars, in which a minimum coefficient of variation was 13.43% in stem thickness and a maximum coefficient of variation was 57.41% in dry weight. 2) The results of correlation analysis showed that there were significant positive relationships ($p<0.05$) between the stem thickness, stem-leaf ratio, dry/fresh weight and the plant height of alfalfa, indicating a positive relationship between the plant height and them. 3) The results of principal component analysis suggested that the top three principal component factors were highly representative of the alfalfa yield, with their contribution rates of 37.404%, 30.246%, and 15.133%, respectively. The eigenvalue of each principal component was greater than 1, with a cumulative contribution rate of 82.783%. Among of them, the eigenvectors of the stem thickness, plant height and fresh weight in the 1st principal component had a larger proportion; the area of trifoliate leaves and single leaf, the length and width of single leaf in the 2nd principal component had a larger proportion;

and the eigenvectors of the number of tillers and the dry/fresh weight in the 3rd principal component were relatively large. **【Conclusion】** The comprehensive analysis combined with the affiliation function method shows that the top three alfalfa cultivars with comprehensive scores are ‘Alola’, ‘218TR’ and ‘Zhao Dong’, which can be selected as fine varieties for promotion and application in production.

Key words: Alfalfa; yield traits; comprehensive evaluation.