

## PROTEIN AND $\beta$ -ODAP CONTENT AND THEIR ASSOCIATION WITH YIELD CONTRIBUTING TRAITS IN SELECTED GRASS PEA LINES

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Eight selected grass pea (*Lathyrus sativus* L.) lines were evaluated over three different growing seasons (2005-2008) at the experimental field at the ‘Sparacia farm’ (Cammarata-AG) in Sicily. A randomized complete-block design with three replicates was adopted. 35 viable seeds/m<sup>2</sup> of each line were placed at the end of autumn in rows distant 50 cm. After one summer ploughing, 90 kg ha<sup>-1</sup> di P<sub>2</sub>O<sub>5</sub> were filled during two harrowing before sowing; later two manual weeds control were performed. Harvest was executed at full maturity of pods (end of the spring). Temperature values and effective rainfall for each season were recorded. Information are presented on the variability in storage seed proteins,  $\beta$ -ODAP ( $\beta$ -N-oxalyldiaminopropionic acid) content and their associations with yield, days to flowering, plant height, 100-seeds weight, seed length, seed width and seed thickness. The mean square for lines, environments and G x E interactions were highly significant for yield, 100-seeds weight, days to flowering, plant height and protein content indicating the existence of a wide range of variation between genotypes and that performance of lines was different over seasons. Correlations coefficients and Principal Components analysis were computed as useful tools to summarize the degree of associations between traits and the total variation showed by the tested lines. Results showed for protein content a negative and non significant correlation with most traits.  $\beta$ -ODAP content showed a positive and high significant correlation ( $r=0.77$ ) only with yield but a negative one with most of the other traits. The first three vectors obtained by the ordination procedure for all traits accounted for 0.86% of total variation. The first component displayed differences in the behaviour of the lines for yield (-0.39), plant height (-0.44), seed length (0.45), seed width (0.33) and ODAP (-0.35); the second component showed different behaviour for protein content (-0.49) and partially for  $\beta$ -ODAP content (0.34); while, 100-seeds weight (0.45), seed thickness (-0.55), and days to flowering (0.60) showed high loadings in the third component. This study suggests that environment, genotype and their interaction affects the protein content and the yield performance; on the contrary, the different sources of variation were found not significant for  $\beta$ -ODAP content. The information here reported may be important to identify the most stable and promising grass pea lines in order to promote the expansion of the crop in sustainable and low-input agricultural systems.