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Lipid Peroxidation and Related Parameters Strongly Influence the Storability of Soybean (Glycine Max) Seeds

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Abstract: A study was carried out with thirteen soybean genotypes differing widely in storability to understand the relationship between storability, seed germination and various parameters of lipid peroxidation such as peroxidase enzyme activity (LOX and HPL), levels of antioxidant molecules (tocopherols, isoflavones and ascorbic acid), antioxidant enzyme activities and fatty acid analysis. A significant negative correlation between storability and the activity of LOX2, HPL as well as TBA no., carbonyl value and total lipid hydroperoxide value was observed; whereas a significant positive correlation existed between storability and antioxidant molecules (ascorbic acid), total antioxidant potential (DPPH and CUPRAC). No correlation was observed between storability and LOX1, LOX3 activities, antioxidant enzymes and the levels of tocopherols and isoflavones. The findings of this work indicates that the antioxidant compounds like ascorbic acid and lipid peroxidizing enzymes such as HPL and LOX2 can be used as a markers to determine the shelf life of soybean seeds and also these parameters can be used to improve nutritional benefits of soybean seed as being a functional food product.

Keywords: Soybean, Glycine max, storability, lipid peroxidation, antioxidant molecules, LOX and HPL enzymes, genotypes, ascorbic acid, antioxidant potential