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“Development on the margin”

## Development of a Drought Stress Scale by Different Parameters Using *Lablab purpureus* as Model System

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### Abstract

Due to the changing climatic conditions, there is an enlargement of land areas with insufficient rainfall and therefore a reduction in the cultivated area for common crops. Hence, it is now important to find plants that are adapted to these drought conditions. *Lablab purpureus* (L.) Sweet which is grown mainly in Africa and South Asia is considered to be drought tolerant. The species *L. purpureus*, common name is *e.g.* hyacinth bean, is a member of the family Fabaceae. This plant is grown in homegardens or is part of mixed cropping schemes (*e.g.* with corn). It has a function as food, forage, herbal medicine, green manure, pharmaceutical or nutraceutical. In this study we compare about 20 *L. purpureus* genotypes collected in different countries and screen them for their tolerance to drought stress. We use different methods to achieve a definitive statement on the drought tolerance of the individual genotypes by combining the methods. This allows us to create a possible drought tolerance ranking of *L. purpureus* genotypes. Methods include PAM Imaging; here we use the fast measurable stress-indicating factor  $F_v/F_m$  to gain information about the state of the photosynthetic apparatus. Other methods are conductance measurements and determination of the leaf turgor pressure by non-invasive probes, in order to obtain information about the water status of the plants. Furthermore, we investigate the stress response of plants in relation to their changes in fresh mass and dry mass. First results are discussed. In the future we want to establish a stress scale to identify and characterise further drought tolerant plant species.

**Keywords:** Drought tolerance, *Lablab purpureus*, stress scale