



Tropentag, October 11-13, 2006, Bonn

“Prosperity and Poverty in a Globalised World—
Challenges for Agricultural Research”

Leaf Senescence Patterns in Cowpea and Assessment of Chlorophyll Depletion by Digital Imaging.

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Abstract

Leaf senescence patterns were investigated with three genotypes of cowpea (*Vigna unguiculata* L. Walp.). The progression of leaflet abscission at the main stem was recorded during the reproductive phase. At harvest, the genotype Lobia had only 8 % of its leaflets abscised, while RCXAC and IFH 27–8 had 29 % and 95 % leaflets shed, respectively. Leaf senescence progressed from the bottom of the plants, but in IFH 27–8 there was a sudden leaf shedding at maturity. The senescence pattern with its genotypic survival rates of leaflets could be related to the distinct patterns of blooming and new pod development of the genotypes. A diagram depicting the time period of blooming showed two connected peaks for Lobia, two separated peaks for RCXAC and only one for IFH 27–8. Furthermore, it remains to be investigated whether the different leaf senescence patterns express differing strategies to use resources for pod production. At harvest, Lobia produced more pods per plant than the other two genotypes, but because of a higher amount of seeds per pod and higher kernel weight, seed yield was higher in IFH 27–8.

A method to estimate chlorophyll depletion by digital imaging is being developed. Chlorophyll analysis of leaflets of various stages of depletion was carried out for all genotypes and the data obtained were then related to the average green intensity value from imaging. This value was calculated by the software tool integrating the colour values of single pixels and the pixel number of the total leaflet area. A highly significant correlation including 6 genotypes may represent a standard curve for cowpea in general.

Keywords: Chlorophyll, cowpea, digital imaging, leaf senescence