faster, more precise and dynamic, and enables it to be carried out in the same group pf plants throughout the life cycle. The goal of this study was to develop and validate a protocol for the estimation of photosynthetic pigment contents in maize leaves using algorithms derived from hyperspectral images generated from visible to the infrared region of the electromagnetic spectrum. To obtain a set of data within a broad range of values, maize plants were subjected to drought. Thus, there were leaves with high, intermediate and low levels of pigments. By using algorithms developed through the three-band model, it was possible to estimate the concentration of chlorophyll a, total chlorophyll and carotenoids using the reflectance values obtained from the maize leaves. It should be stressed that the algorithms developed were not specific, i.e., the same algorithm could be used to estimate the concentration of more than one pigment. This is probably due to the maintenance of the ratio between photosynthetic pigments on the grown condition that plants were subjected.
Keywords: *Zea mays*, chlorophyll, carotenoids, drought stress
Acknowledgments: Embrapa/PHENOCORN (SEG: 05.12.12.001.00.00)

I10 - Use of S*etaria viridis* (A10.1) as model plant for validation of genes for cold tolerance

Santos ML[1], Silva VNB[2], Vieira LR[2], Sousa CAF[3], Souza Jr. MT[3]
[1]Mestranda do Programa de Pós-Graduação em Biotecnologia Vegetal da UFLA, Lavras, MG; [2]Doutoranda da UFLA na Embrapa Agroenergia, Brasília, DF. leticia_rios1518@hotmail.com; [3]Pesquisador, Embrapa Agroenergia, Brasília, DF

Cold is an important abiotic stress limiting plant growth and reducing productivity. It causes a decrease in metabolic rates and damage to the photosynthetic apparatus. Cold tolerance in plants can be achieved by the heterologous expression a cold tolerance gene, or by a gene editing strategy. *Setaria viridis* has been used as a model plant in fast proof-of-concept studies aiming gene function validation. To use such a plant for studying a particular type of stress, one must show that it is susceptible (not tolerant) to that stress. The goal of this study was to prove, by the characterization of its physiological response to cold stress, that *S. viridis* (access A10.1) can be used as a model plant for validation of putative cold tolerance genes. Two batches of seeds were germinated in culture medium under a photoperiod of 16/8 hours (light/dark), 25±2 °C, and light intensity of 150 µmol $m^{-2}s^{-1}$. Week-old seedlings were transferred to a substrate and submitted to a light intensity of 500 µmol $m^{-2}s^{-1}$. Plants, fifteen (3rd stage) and twenty-nine (5th stage) days after transplanting, were submitted to 10 °C for six days; returning to 25 °C after that. Results showed a reduction in net CO_2 assimilation rate, stomatal conductance to water vapor and transpiration, and the internal concentration of CO_2 practically doubled, in both development stages. After returning to 25 °C, plants from the 3rd stage recovered the gas exchange rates faster than from the 5th stage. Biomass production at the end of the cycle did not differ, independently of the stage at which stress was applied. Seed production, in turn, was negatively affected by the cold, but only when it was applied in the 5^{th} stage of development.
Keywords: Cold, tolerance, Setaria, stress, abiotic