ISTA 23

XXIII INTERNATIONAL SEED TESTING CONGRESS

SYMPOSIUM ABSTRACTS

BUENOS AIRES ARGENTINA
NOVEMBER 2 - 4 1992

The analysis of yield components is used to identify sources of variation, which can be exploited in plant breeding or agricultural practices for improving seed production in chicory.

Two different landraces have been considered in this research. One type is grown for its immature flower stalks under the name of "Cicoria di Galatina", the other type for its leaves, known under the generic name of "Cicoria da foglia". Sixty plants of each landrace were taken at random using a completely random design. They were analyzed for the following characters: seed yield, number of capitula per plant, number of seeds per capitulum, 1000 seed weight, percentage of seed germination, number of flowers per capitulum, plant height, root diameter at the crown level, number of stalks per plant, plant biomass weight at the time of seed harvesting. The linear dependence of seed yield to the other yield and vegetative components has been studied using a stepwise regression.

Results showed variability within each landrace for all yield and vegetative components. The two landraces differ mainly for plant seed yield (10.9 and 5.7 9 in the "Cicoria di Galatina" and "Cicoria da foglia", respectively), plant height (79 vs. 133 cm) and aboveground plant biomass (252 9 vs. 390 9). The difference in seed yield is due to the differing number of fertile capitula per plant (42% vs. 23%), which is not attributable to a different reproductive system because both landraces showed self-incompatibility under net covering condition. The stepwise regression analysis shows that the number of capitula per plant explains 78% of the variability, while the 1000 seed weight and number of seeds per capitulum make up 8% and 6%, respectively. Thus, seed production in both landraces is determined more by the number of capitula per plant and less by the number of seeds per capitula and the 1000 seed weight. Positive correlation exists in the "Cicoria di Galatina" between seed yield or its components and plant biomass (r - 0.76), while there is no correlation in the other landrace. The two landraces differ also in seed germination percentage, 70% vs. 50%. No inference can be drawn on the relationships between seed germination percentage and seed yield and vegetative plant components because of contradictory results in both landraces.

Nr. 3

Soybean Seed Quality as Affected by Shrivelling due to Heat and Drought Stresses During Seed Filling

By: J.B. Franca-Neto, F.C. Krzyzanowski, A.A. Henning, EMBRAPA-CNPSO C.P. 1061, 86001 Londrina PR, BR-Brazil
S.H. West, USDA-ARS, University of Florida, Gainesville, FL, USA
L.C. Miranda, EMBRAPA-Foundation Seed Program, Londrina, PR, BR-Brazil

A high level of shrivelled soybean seeds was detected in several regions in Brazil in 1990. The production of shrivelled soybean seeds is also reported in some areas in the U.S.A. This problem is registered in some areas of Florida (USA) and Parana (BR) almost annually. The occurrence of shrivelling means losses to the producers of soybean seed and grain. Shrivelling results from the occurrence of heat (air temperature above 32° C) and drought stresses during seed filling. These stresses may result in 100% shrivelled seeds in some cultivars, such as "Bragg". Two experiments were conducted to determine the effects of different levels of shrivelling on the quality of soybean seeds. Two genotypes were studied: "Forrest", produced in Gainesville in 1987, and the breeding line BRAS 85-8121, produced in Londrina in 1989. Seed samples were prepared with different levels of shrivelling: 0, 5, 10, 15, 20, 30, 40, 50, 60, 70, 80, 90 and 100%. Dry weight (9/100 seeds) decreased as shrivelling increased. Percentage oil and protein in the seeds increased with shrivelling. Seed quality, as determined by several tests (germination, tetrazolium, accelerated aging, blotter, and emergence in sand), was significantly reduced as the level of shrivelling increased. However, this reduction in quality was more accentuated for seeds of "Forrest". Seeds of this cultivar were subjected to additional stresses: high temperatures and relative humidities during maturation.

Nr. 4

Morphological Aspects of Weathering and Immaturity in Sorghum (*Sorghum bicolor* L. Moench) Associated with Seed Specific Gravity

By: A.S. Goggi, J.C. Delouche and L.M. Gourley, Mississippi State University, Dept of Agronomy, P.O. Box 5248, Mississippi State, MS 39762, USA

Sorghum seeds (Wheatland cv.) from panicles harvested at physiological maturity, exposed to field weathering or to artificially induced immaturity, were separated into high (>1.30) and low (<1.20) specific gravity levels to determine the effects on seed internal morphology. Scanning electron microscope photomicrographs revealed cavities and profuse fungal growth in the placental sac area and in the embryo of seeds from the more intense weathering treatments and low specific gravity class. Similar cavities were observed in the immature seeds. Endosperm cells in the immature seeds were not completely filled with starch granules, and the epithelial and aleurone layers were not fully developed. The presence of cavities reduced the density of the seeds, consequently their specific gravity was lower. Seeds of low specific gravity also occurred among those harvested at physiological maturity, and they also exhibited morphological features of weathered or immature seeds or both. This suggested different exposures of seeds to weathering or varying maturity according to their location in the panicle.