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DETECTION OF CROSSOVER INTERACTIONS IN MULTI-LOCATION RICE TRIALSMarcos Malosetti^{1,2}, Fred van Eeuwijk², Sergio Ceretta³, Andrés Lavecchia⁴¹ Facultad de Agronomía, Uruguay; ² Laboratory of Plant Breeding, Wageningen University, The Netherlands; ³ INIA "La Estanzuela", Uruguay; ⁴ INIA "Tacuarembó", Uruguay

The occurrence of crossover interaction in multi-location trials is of major concern for crop growers and breeders. Crossover interactions change the rank order of genotypes across locations. In this paper, we investigated the occurrence of crossover interactions in a Uruguayan rice data set (3 years, 4-5 locations). We combined two approaches; informal graphical biplot analysis (GGE-biplot) and formal statistical testing for crossovers (Gail-Simon test). The biplots allowed a quick informal overview of possible crossover interactions. The formal test identified most of the crossover interactions found by the biplot analysis, although some crossover interactions were found significant that were not identified in the biplot. Therefore, the informal biplot procedure is certainly useful, but cannot completely replace the formal testing procedure. The existence of significant crossover interactions indicated that no simple reductions in the number of testing locations for rice in Uruguay are possible.

Keywords: variety testing, multi-location trials, crossover interaction, biplot

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RICE VARIETIES ADAPTED AND CREATED IN MOROCCAN CONDITIONS.

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On 1948 rice crop was introduced in Morocco to evaluate the heavy and flat soils of the Gharb region (North West). Actually, it's extended to the extreme north (Loukkos) with 1300 ha. The total area is about 9000 ha. The average yield is 5 tons/ha. The consumption is about 1, 5 kg/person/year of paddy. In Morocco, rice is cultivated under irrigation conditions from April to September and it's represented by Indica and Japonica. Thaibonnet, Elio and Lido represent now more than 90% of cultivated areas. The strategy of Rice breeding program is to improve varieties with high potential of production, short duration, resistant to blast, tolerant to various environmental stress and good quality. The prospect of research has 3 levels: development of cooperation with international organization, application of technology for breeding and cultivation and transfer of technology to the farmers. To improve varieties two methods are adapted: cross between local varieties and selected material and introduction of foreign. This year 118 rice genotypes are introduced into Morocco from CIRAD France. Those varieties were adapted and evaluated for their behavior, yield components, quality and resistance to blast. Several trials and experimentation are conducted in Allal Tazi Experimental station (50 km from Kénitra). The result indicates 11 perform ante varieties with a good potential already unregistered in the catalogue official. The agronomic and quality performance of INRA varieties will be giving on the paper.

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RICE PLANT TRAITS RELATED TO YIELDING ABILITY UNDER WATERGRASS (*Echinochloa phyllopogon*) COMPETITION IN CALIFORNIA'S TEMPERATE CONDITIONS. II. TRAITS AND YIELD TRADE-OFF.Pérez de Vida, F.B.¹; Fischer, A.J.²; Mackill, D³; Laca, E². INIA, Treinta y Tres, Uruguay¹; University of California, Davis, CA, USA²; IRRI, Los Baños, Philippines³.

It had been demonstrated that under strong watergrass (WG) competition, rice-yielding ability was strongly determined by rice biomass (BiomHd) accumulation at heading and to a somewhat lesser extent by harvest index (HI). BiomHd was more affected by weed competition than HI. Here we discuss the relative importance, and negative impacts, of early rice traits that contribute to BiomHd and HI. Glasshouse studies were conducted at Biggs, CA, during 2000 and 2001. Rice cultivars M-202 (strong competitor), A-301 (weak competitor) and six experimental lines derived from a M-202/O. nivara//M-202//M-202 cross. A factorial combination of cultivars (RC) (6 plants/pot) and weed competition regime (WCR) (0 and 2 *Echinochloa* plants/pot) was arranged in a randomized complete-block design with five replications. Data were subjected to path analysis. A significant multivariate model explained 65.4% of variability in rice BiomHd. Rice characteristics with significant and positive path coefficients to BiomHd, were the number of tillers per plant (TPP_{36DAS}), early biomass (Biom_{36DAS}), relative growth rate to heading (RGR_{36-Hd}), and the canopy traits leaf area (LA_{36DAS}), leaf weight ratio (LWR_{36DAS}) and relative leaf area expansion rate (RLAER_{36-Hd}). With their larger direct path coefficients, LA_{36DAS} and LWR_{36DAS} were the main contributors towards rice growth until heading. A multiple regression model including shoot length (SL_{36DAS}), TPP_{36DAS}, SLA_{36DAS}, LA_{36DAS}, LWR_{36DAS}, RGR_{36-Hd} and RLAER_{36-Hd} as variables explained 35.7% of the variability in HI. Of those, the canopy traits LA_{36DAS}, SLA_{36DAS}, LWR_{36DAS} and RLAER_{36-Hd} negatively affected HI. Our results indicate that early leafiness supports BiomHd, the most weed-sensitive component of rice performance under competition, but it also negatively affects the efficiency of biomass allocation to grain. Therefore, breeding for certain traits that would enhance rice performance under WG competition could involve yield penalties resulting from a lowering of the HI. Keywords: rice competitiveness, breeding, trade-off, yield penalty, harvest index.

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GENETIC VARIABILITY BY INDIRECT ORGANOGENESIS IN RICE MAGALHÃES JR., A.M. de¹; LEDA FONTELLES DA SILVA TAVARES, L.F. da S.¹; PETERS, J.A.² 1- Embrapa Clima Temperado, Cx. Postal 403, CEP 96001-970, Pelotas, RS, Brazil. 2- UFPA-FAEM, Cx. Postal 354, Cep.: 96010-900, Pelotas, RS, Brazil.

Rice in Brazil shows a narrow genetic bases. In the Rio Grande do Sul state only six ancestrals contribute on 86% of the genes from the majority cultivated varieties. Cultured. By means of tissue culture is possible to induce genetic variability. This work aimed to establish an efficient protocol to callus induction and a in vitro regeneration of rice plants (BRS 7 "Taim" variety). Explants from meristematic section of tip shoots plantlet were utilized. The shoots shoot regeneration, by indirect organogenesis, was developed in twophase phases: callus induction and shoots regeneration. For callus induction were used salts and vitamins MS plus inositol (100 mg.l⁻¹) e , sucrose (30 g.l⁻¹), Agar (7,0 g.l⁻¹) and Fitagel (2,5 g.l⁻¹). compound the following traits: MS; MS + 2,0 mg.l⁻¹ 2,4-D; MS + 4,0 mg.l⁻¹ 2,4-D; MS + 2,0 mg.l⁻¹ 2,4-D + 12mM prolin + 2,0 mg.l⁻¹ casein + 30 g.l⁻¹ sorbitol + 5mM MES. Agar (7,0 g.l⁻¹) and fitagel (2,5 g.l⁻¹). For shoots regeneration, callus obtained were transferred to different basic medium, compound by MS and N₆ (Chu et al., 1975): MS + 30 g.l⁻¹ sucrose; MS + 5,0 mg.l⁻¹ KIN + 1,0 mg.l⁻¹ ANA + 30 g.l⁻¹ sucrose; MS + 3,0 mg.l⁻¹ KIN + 0,2 mg.l⁻¹ ANA + 30 g.l⁻¹ sucrose; MS + 2,0 mg.l⁻¹ BAP + 0,5 mg.l⁻¹ ANA + 30 g.l⁻¹ sucrose; MS + 1,0 mg.l⁻¹ TDZ + 0,1 mg.l⁻¹ ANA + 2,0 mg.l⁻¹ casein + 30 g.l⁻¹ sorbitol + 5mM MES + 12 mM prolin + 10 g.l⁻¹ sucrose; MS + 80 g.l⁻¹ sucrose; N₆ + 80 g.l⁻¹ sucrose e N₆ + 30 g.l⁻¹ sucrose The results showed that all treatments with 2,4-D formed callus, but only those supplemented with sorbitol, prolin, casein and MES MES obtained regeneration, which was better when fitagel Fitagel was used. The treatments formed with MS' salts and vitamins showed better shoots regeneration than N₆ medium.

Key Words: indirect organogenesis, tissue culture, plant breeding