ABSTRACTS

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150 pl m^{-2}) and 3 levels of nitrogen fertilization (0, 50 and 100 kg ha^{-1}) were employed during the second year. The determinations were: tiller number, total above ground biomass, yield and components, leaf area index, height, length and width of the flag leaf, height of the penultimate expanded leaf and relative growth rate. The competition was evaluated by means of the Competitive Ability (aggressivity) and Resources Complementarity (relative yield total, RYT). The total above biomass was an interesting characteristic to offer competitive ability in the first year at first node detectable, while in the second year this trend was conditioned by the density of the weed and the fertilizer levels. At anthesis and maturity, we observed that more production in pure crop, major tolerance to the competition, but, as a previous determination, this relationship loses importance due both the increase of the nitrogen level and density of *Lolium multiflorum*. We observed that LAI doesn't appear granting a greater aggressiveness while a positive correlation between the aggressiveness and the height of the penultimate expanded leaf and height, area and length of the flag leaf was obtained. The use of competitive ability appears as an important factor to incorporate as selection criteria in the local breeding programs, given the variability observed in the genotypes evaluated.

Competitive effects of *Setaria parviflora*, Poir, Kerguelen, on alfalfa growth during summer (47)

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Dairy production in the area of Santa Fe (Argentina) is mainly based on rotational grazing systems on alfalfa, which is the most widely grown perennial pasture. Alfalfa varieties are winter active and plant structure is better adapted for hay cutting than for grazing. Persistence is no longer than 3 years. Grass weed invasion in summer is a serious problem, because these weeds severely compete with alfalfa when grazed in subtropical environments. In Santa Fe, the most important grass weed is *Setaria parviflora* (baraval) which is a C4 species. This study was undertaken to determine the relationship between baraval growth and alfalfa persistence regarding the production pattern of stems, leaf area and dry matter yield in summer under a rotational grazing system. In 1994, plots with four treatments were determined in a one year alfalfa pasture, according to the species growing in each: 1) pure alfalfa; 2) alfalfa and baraval; 3) alfalfa and weeds different from baraval and 4) pure baraval. For each species dry matter content, plant height, number of organs and leaf area were determined every 15 days during summer. The experimental design was a randomized complete block with treatments replicated three times. Analysis of covariance was conducted for different populations. In weeded plots, the plant stand of alfalfa was significantly reduced from 22 plants m^2 in weed free plots to 17 in those with baraval. Alfalfa stem and leaf dry matter yields were reduced in weeded plots and so were the number of stems and the leaf area. When weeds were competing and especially when baraval was the main weed, alfalfa plants had fewer stems and leaves and a lower dry matter production. An asymmetric mortality had occurred as described for other species. Baraval was more competitive than other grasses because its strong tillering (almost 200 per plant) and the erect growth of the plant, which reaches a similar height as alfalfa (45 cm) before grazing, thus possibly competing for light.

Effect of bulb depth on the development of *Oxalis latifolia* Kunth (48)

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After consultations carried out during summer 1998 in several guipuzcoan country houses, *Oxalis latifolia*, a widely distributed weed in tropical and temperate climates all around the world, has been identified as the most loathed weed. In prevision and comprehensive fight against *O. latifolia*, its bulbs were planted at 1 and 12 cm under the soil surface. With that, the influence of the depth on the yearly development cycle of *O. latifolia* as well as the importance of a turning over of the arable soil on its removal could be understood. Periodical observations, carried out during the 1999 growing season, have demonstrated that

depth has considerable effects in plant development. Surface individuals are the only ones which develop enlarged roots, one, two or, even, three, used for accumulating water as well as for maintaining the bulb at due depth. Moreover, individuals at the surface develop leaves and second generation bulbs earlier, and in greater number, than those buried more deeply. Besides, these second generation bulbs produced leaves with great precocity. And finally, only shallow bulbs bloomed.

Growth analysis of resistant and susceptible wild poinsettia biotypes to ALS inhibitor herbicides (49)

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All natural weed populations regardless of the application of any weed killer probably contain individual plants (biotypes) which are resistant to herbicides. Persistent herbicide use will expose the weed population to a strong selection pressure which may lead to an increase in the number of surviving resistant individuals in the population. Repeated use of imidazolinone herbicides in continuous no-till soybean selected a herbicide resistant biotype of wild poinsettia (*Euphorbia herophylla*) in Cafelandia county of Parana State, Brazil. A comparative study of growth and development of wild poinsettia resistant and susceptible to ALS (acetolactate synthase) inhibitor herbicides was carried out at Embrapa Soja, Londrina, Parana State, Brazil. The total dry matter, leaf area, shoot dry weight, leaf dry weight, root dry weight and plant height were measured weekly 13 times, starting 14 days after sowing. Data were analyzed with a polynomial exponential function. The response variable for the whole growth period was estimated using 95% confidence interval. Relative growth rate, net assimilation rate, leaf area ratio, leaf weight ratio and specific leaf area decreased with plant ontogeny and behave similarly in both biotypes. The total dry matter of the plants and their organs as well as the leaf area and plant height exhibited similar ranges of variability in both biotypes. There were no significant differences between biotypes for growth and development characteristics.

Compensatory responses to crop shading by *Cynodon dactylon* (L.) Pers. (50)

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It was suggested that for a maximum weed suppression a crop should be planted in a uniform spatial arrangement. An equidistant crop planting delays the beginning of intraspecific competition in crop stands leading to maximum efficiencies in the capture and use of resources by a weed-free crop. But when early competition by weeds can reduce the availability of a limiting soil resource as nitrogen, the advantages of an uniform crop pattern could be lost for the crop. A field experiment was conducted with the objective of analyzing the growth response of *C. dactylon* to maize competition when this crop was planted at three rectangularities and at a constant stand density. Our hypotheses was that an anticipated preemptive capture of the aerial space by the most uniform crop increases its weed suppressing effect in terms of dry matter and N accumulation by *C. dactylon*. A commercial single hybrid of maize was sown at 8 pl m^{-2} in 3.50 x 3.50 m plots according to a completely random design with five replicates. The planting patterns were 0.35 m x 0.35 m, 0.25 m x 0.55 m and 0.18 m x 0.70 m. Photosynthetically active radiation (PAR) transmitted through the crop canopy was measured periodically and integrated for the whole crop cycle. Total biomass and N accumulated by the weed at crop maturity did not differ among crop spatial patterns even though total PAR intercepted by the weed canopy diminished in ca. 20% with crop uniformity. This homeostasis was explained by the increased proportion of aerial biomass which in turn had higher N content than rhizomes. The starting large reserves in rhizomes and a rapid lateral expansion through stolon elongation