

TÍTULO: *'Chiquitita' olive*
REVISTA: HORTSCIENCE 43 (2):529-531 2008
AUTHOR(S): Rallo, L; Barranco, D; de la Rosa, R; Leon, L
ABSTRACT: 'Chiquitita' is a new olive (*Olea europaea* L.) cultivar obtained in a crossbreeding program in Cordoba, Spain. 'Chiquitita' was derived from a cross carried out in 1991 between 'Picual' and 'Arbequina', two cultivars with high productivity and oil content from different geographical origins: 'Arbequina' from Catalonia in the northeast of Spain and 'Picual' from Andalusia in the south of Spain (Rallo, 1995). The results of the agronomical evaluation carried out in Cordoba allow the final selection of 'Chiquitita' as a new olive cultivar with early bearing, high oil content, and yield efficiency. Its low vigor and compact and weeping growth habit make it particularly adapted to high-density hedgerow orchards. 'Chiquitita' is the first olive cultivar developed by the cooperative breeding program carried out by the University of Cordoba and the Institute of Agricultural and Fishery Research and Training (IFAPA).

TÍTULO: *Ripening time and fruit characteristics of advanced olive selections for oil production*
REVISTA: AUSTRALIAN JOURNAL OF AGRICULTURAL RESEARCH 59 (1):46-51 2008
AUTHOR(S): de la Rosa, R; Leon, L; Moreno, I; Barranco, D; Rallo, L
ABSTRACT: In the olive breeding program of Cordoba, Spain, the first 15 obtained selections has recently been tested in a comparative field trial, including their genitors, 'Arbequina', 'Frantoio' and 'Picual', as a control. In this work, we report the evaluation of the fruit characteristics and ripening time of those selections. Average data recorded in the comparative field trial orchard in two consecutive harvest seasons were used for statistical analysis. A high degree of variability and significant differences between genotypes were obtained for all the fruit characteristics analysed, and for ripening time and extractability index. For most of those parameters, selections showing better values than the genitors have been found. In particular, many of the selections had higher oil content than the genitors. Data for seedling plants evaluation was significantly correlated with data of the reported field trial for fruit weight, fruit removal force/fruit weight ratio and oil content. This indicates that selection in the seedling stage for these characters can be efficiently performed, even when only the first year of agronomic evaluation of the seedling is considered. On the contrary, seedling selection for fruit moisture, fruit removal force and ripening date seems to be difficult to perform. In summary, the results of the agronomic evaluation suggest that some of the selections could be released as new olive cultivars in the near future, for first time in Spain.

TÍTULO: *Fatty acid composition of advanced olive selections obtained by crossbreeding*
REVISTA: JOURNAL OF THE SCIENCE OF FOOD AND AGRICULTURE 88 (11):1921-1926 2008
AUTHOR(S): Leon, L; De la Rosa, R; Gracia, A; Barranco, D; Rallo, L
ABSTRACT: BACKGROUND: An olive-breeding programme aimed at obtaining new cultivars for olive oil production was initiated in Spain in 1991, with oil quality being considered one of the most important objectives. In this study the oil fatty acid composition of 15 advanced olive selections coming from crosses between 'Arbequina', 'Frantoio' and 'Picual' cultivars was evaluated. RESULTS: A strong genetic effect and significant differences between genotypes were obtained for all fatty acids and ratios evaluated. The results allowed the classification of genotypes into four groups according to their fatty acid composition, with the percentages of C18:1, C18:2 and saturated fatty acids being the main contributors to the total variation. The relationship between the results of the initial seedling population and those of the advanced selections indicated that an efficient selection for fatty acid composition could be carried out by considering only a single year of evaluation at the seedling stage. CONCLUSION: A quite different fatty acid composition in the oil of 15 advanced selections and their three genitors was obtained. These results suggest that new olive cultivars with fatty acid composition fulfilling consumer and market demands could be obtained through crossbreeding in the future. © 2008 Society of Chemical Industry.

TÍTULO: *Breeding for early bearing in olive*
REVISTA: HORTSCIENCE 42 (3):499-502 2007
AUTHOR(S): Leon, L; de la Rosa, R; Barranco, D; Rallo, L
ABSTRACT: The initial results of a comparative field trial of the first 15 selections of the olive (*Olea europaea* L.) breeding program of Cordoba, Spain, are presented. These selections came from crosses among 'Arbequina', 'Frantoio', and 'Picual' that were also included in the trial as controls. The trial was planted in July 2001 in a randomized block design with 16 replications and was systematically evaluated for earliness of bearing, vigor, crop, and yield efficiency from 2001 to 2005. Significant differences among selections were found for all characters measured. A greater proportion of earlybearing genotypes than in previous cultivar collections were found, whereas mean accumulated yield was similar to former evaluations. Therefore, the shorter unproductive period obtained in this work seems to indicate that the selection of seedlings for a short juvenile period has provided a shorter unproductive period of the subsequent new cultivars. No correlation between vigor at the seedling stage and vigor in the corresponding adult vegetative propagated selection was found. If the data presented here are confirmed further, some early-bearing cultivars could be suggested as new olive cultivars, the first obtained by cross-breeding in Spain. Additionally, some of them also show a low vigor and could be adapted to high-density hedgerow orchards.

TÍTULO: *Seedling vigour as a preselection criterion for short juvenile period in olive breeding*
REVISTA: AUSTRALIAN JOURNAL OF AGRICULTURAL RESEARCH 57 (4):477-481 2006
AUTHOR(S): De la Rosa, R; Kiran, AI; Barranco, D; Leon, L
ABSTRACT: The juvenile period represents a serious impediment in olive breeding programs. Seedlings with long juvenile period are of very low interest for the breeder because their evaluation considerably delays the first stages of the breeding process. For this reason, the influence of seedling vigour (measured as plant height or stem diameter) on the characteristics at the adult stage was studied to establish useful negative preselection criteria on the basis of that relationship. Olive progenies from crosses and open pollinations of 12 different parents carried out in 1998 and 1999 were evaluated in the greenhouse and, afterwards, during the first 3 years of bearing in the open field. The results obtained indicate that early evaluation and selection for juvenile period can be performed at the seedling stage in olive progenies on the basis of vigour measurements. Selection for short juvenile period was valid irrespective of parentage and, therefore, could be efficient in a general context. No relationship between juvenile period and yield or fruit traits was found so that this preselection criterion would have no adverse

TÍTULO: *Selection for fruit removal force and related characteristics in olive breeding progenies*
REVISTA: AUSTRALIAN JOURNAL OF EXPERIMENTAL AGRICULTURE 45 (12):1643-1647 2005
AUTHOR(S): Leon, L; de la Rosa, R; Barranco, D; Rallo, L
ABSTRACT: In the present work we discuss the possibility of breeding olives for suitability to mechanical harvesting. Variability in fruit removal force (FRF), and its correlation with fruit weight (FW) and yield were evaluated in reciprocal crosses of 'Arbequina', 'Frantoio' and 'Picual' cultivars. A wide range of variation was observed for FRF among the genotypes evaluated. A high correlation between FRF and FW was observed but not between FRF and yield. Analysis of variance showed significant differences among years but not among female genitors. Differences among genotypes, irrespective of their genitors, were also found, with the variance due to genotype being higher for FRF/FW than for FRF as dependent variable. Correlations of genotype data between years were significant for FRF/FW but not for FRF. The relatively low correlation values indicated that only some negative selection could be done on the basis of FRF/FW at the first stage of the breeding process, owing to the importance of the environmental variability. A more precise evaluation is needed during the successive stages of breeding, where several replicates per genotype are available.

TÍTULO: *The length of the juvenile period in olive as influenced by vigor of the seedlings and the precocity of the parents*
REVISTA: HORTSCIENCE 40 (5):1213-1215 2005
AUTHOR(S): Santos-Antunes, F; Leon, L; de la Rosa, R; Alvarado, J; Mohedo, A; Trujillo, I; Rallo, L
ABSTRACT: A first attempt to determine the effect of vigor and parents on the length of the juvenile period of olive seedlings is here reported. Vigor seems to have a significant influence on the percentage of flowering seedlings, especially in the first 2 years of bearing. The different parents used have produced differences in the juvenile period of their descendants. A correspondence between the length of the unproductive period of the parents and the length of the juvenile period that they transmit to their descendants has been observed. The seedling forcing growth protocol described here has been able to produce flowering seedlings 28 months after germination, with >93% of seedlings flowering 65 months after germination.

TÍTULO: *Variability and early selection on the seedling stage for agronomic traits in progenies from olive crosses*
REVISTA: PLANT BREEDING 123 (1):73-78 2004
AUTHOR(S): Leon, L; Rallo, L; Del Rio, C; Martin, LM
ABSTRACT: Yield per tree, ripening date and oil content components (fruit fresh weight, flesh moisture, flesh/stone ratio both on fresh and dry weight basis, flesh and fruit oil content on dry weight basis) have been studied during 3 years in seedlings from crosses among the olive cultivars 'Arbequina', 'Frantoio' and 'Picual'. Genetic and environmental variances and year-to-year consistency of data were estimated. Most of the traits evaluated showed a range of variability as large or even larger than either the range observed in a random sample of cultivars from the World Olive Germplasm Bank of Cordoba or the range reported in the evaluation of olive cultivars collections. Betweenyears correlation coefficients showed that for a character such as oil content the values obtained in the first year could be reliable indicators of the values obtained in following years. Observations over 2 years may be required for characters such as fruit weight or flesh/stone ratio on a fresh weight basis and even more than 2 years may be required to estimate yield per tree.

TÍTULO: *Phenotypic correlations among agronomic traits in olive progenies*
REVISTA: JOURNAL OF THE AMERICAN SOCIETY FOR HORTICULTURAL SCIENCE 129 (2):271-276 2004
AUTHOR(S): Leon, L; Martin, LM; Rallo, L
ABSTRACT: Thirteen characters were evaluated over four years in progenies from a diallel cross among the olive (*Olea europaea* L.) cultivars 'Arbequina', 'Frantoio', and 'Picual' to determine if phenotypic correlations existed between these characters. Yield per tree, ripening date, oil yield components and fatty acid composition were recorded annually once seedlings began to flower and produce fruit. Significant correlations were found between several characters including oil yield components and fatty acids composition. Lower correlation coefficients were obtained between ripening date and oil and oleic acid content. Generally, yield was not correlated with the other characters evaluated. Principal components analysis confirmed the main correlations among characters and showed them to be independent of the parents used.

TÍTULO: *Repeatability and minimum selection time for fatty acid composition in olive progenies*
REVISTA: HORTSCIENCE 39 (3):477-480 2004
AUTHOR(S): Leon, L; Martin, LM; Rallo, L
ABSTRACT: Fatty acid composition has been studied in seedlings from a diallel cross (nine families) among 'Arbequina', 'Frantoio', and 'Picual' olive (*Olea europaea* L.). Variance among samples within genotype, genetic and environmental (yearly) variances, and year-to-year consistency of data were estimated. A correlation analysis of the standardized data for fatty acid composition between first and second year data was also carried out to select the most interesting genotypes as early as possible. The results showed that fatty acid composition exhibit significant differences between genotypes and years. The variance component attributable to differences between genotypes represented >60% of total variance for all the fatty acids evaluated. High correlation coefficients between the first and second year data were found for oleic and linoleic acid percentage; these correlations were slightly poorer for the other fatty acids analyzed. These results may be useful for improving the efficiency of olive breeding programs in first-stage selection on whole progeny populations.

TÍTULO: *Parent and harvest year effects on near-infrared reflectance spectroscopic analysis of olive (*Olea europaea* L.) fruit traits*
REVISTA: JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY 52 (16):4957-4962 2004
AUTHOR(S): Leon, L; Garrido-Varo, A; Downey, G
ABSTRACT: The influence of parent and harvest year on the determination of oil, moisture, oleic acid, and linoleic acid contents in intact olive fruit was studied by near-infrared spectroscopy (NIRS). Spectral data from 400 to 1700 nm were recorded on 437 fruit samples collected in 1996 and 1997 from seedling plants derived from three different female parents. Partial least squares models were developed using samples for each year and for each female parent separately and were validated against the other groups. Calibration models were accurate enough to predict all constituents in new samples from a different female parent but were not transferable across years. However, a calibration equation of sufficient accuracy was obtained from the combined data set (*r* values of 0.94, 0.93, 0.84, and 0.88 and RMSECV values of 1.33, 1.88, 4.73, and 2.91 for oil, moisture, oleic acid, and linoleic acid contents, respectively). These results demonstrate the utility of NIRS as a selection tool in olive breeding programs.

TÍTULO: *"Sikitita", nuova varietà per oliveti superintensivi*
REVISTA: GEORGOFILI INFO 16 Gennaio 2013
www.georgofili.info/detail.aspx?id=1173

TÍTULO: *Retos del mejoramiento genético del cultivo del olivo*
REVISTA: VIDA RURAL 356: 60-66 2013

TÍTULO: *Sikitita y el futuro de la mejora genética*
REVISTA: FRUTICULTURA Especial Olivicultura 24: 4-12 2012

TÍTULO: *La olivicultura mirando al mañana: Retos del mejoramiento genético*
REVISTA: A&G 88: 442-449 2012



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