1999 and 2001. Vietnamese rootstocks types was planted in 2005. Rootstocks in each planting were grafted on to Navelina, Lane Late navel, Eureka lemon and Imperial mandarin. Data for yield, fruit quality, fruit size distribution and tree growth was collected for 10 years for each stage of planting. Some of the recommended rootstocks Donghai, Tanghe and Zao Yang from the first phase of research evaluation are now being tested in semi-commercial orchards in Riverina. The Australian rootstock program has now established strong links with the Spanish breeding and rootstock evaluation program to test the recommended Chinese material in Spain; while promising Spanish rootstocks will be tested under Australian conditions. The entire program is discussed in detail and data is presented on yield and quality from the semi-commercial trial of Valencia clones grafted to the recommended Chinese rootstocks in Riverina.

Financial support: HIA, Australia.

Keywords: orange; manadarin; rootstock.

S17-194

PERFORMANCE OF FIVE SWEET ORANGE (*Citrus sinensis*) CULTIVARS ON FOUR ROOTSTOCKS UNDER MAHARASHTRA STATE, INDIA

Dhake AV, Patil DG & Balkrishna

Jain Irrigation Systems Limited;
e-mail: dr.dhake.anil@jains.com

Evaluation of five sweet orange cultivars, viz. Hamlin, Valencia, Pera, Westin and Natal on four rootstocks, viz. Volkameriana, Swingle citrumelo, Cleopatra tangerine and Rangpur lime was conducted during 2014 and 2015 on four year old plantation in central India (Jalgaon) under sandy loam soil. Maximum plant height was found in Hamlin on Volkameriana produced while Pera was dwarfest on T. Cleopatra as compared to other rootstock scion combinations. Rootstock average value tallest to dwarf plants were Volkameriana followed by Rangpur lime, C. Swingle and T. Cleopatra however for varieties this order was Hamlin followed by Valencia, Natal, Westin and Pera. Hamlin on C. Swingle produced largest canopy and Pera on T. Cleopatra produced smallest canopy volume. Among the rootstocks C. Swingle produced longest and T. Cleopatra produced smallest canopy. The maximum scion circumference was observed in Hamlin and minimum in Westin. Valencia recorded maximum value for fruit weight Maximum juice content was observed in Pera while highest TSS level was observed in Hamlin. Natal followed by Hamlin and Valencia budded on C. Swingle registered higher yield (67.10, 63.5, 53.9) during 5th year of plantation however lowest yield was observed in Valencia budded on Volkameriana. We could categorize yield in four group very good (>50), good (35-50), average (20-35) and poor (<20).Hamlin, Natal and Valencia on C. Swingle can be grouped in to very good yielder, Hamlin, Natal, Valencia on T. Cleopatra, Natal and Westin on Rangpur lime and Westin on Volkameriana can be categoral as good yield. Rest of the combinations was in average yielding category except value on Volkameriana was a poor yielder.

Financial support: Jain Irrigation Systems Limited.

Keywords: sweet orange; rootstock and cultivars; yield.

S17-201

EVALUATION OF CITRUS SELECTIONS ARISING FROM NATURAL MUTATION IN AUSTRALIA

Sanderson GP

NSW Dept. of Primary Industries;
e-mail: graeme.sanderson@dpi.nsw.gov.au

The Australian citrus industry has supported an on-going, independent variety evaluation program since 2001 funded by Horticulture Innovation Australia (HIA). The majority of new citrus varieties introduced to Australia as either public access or with plant breeders rights (PBR) are included in the program. New varieties have been introduced to Australia as public varieties by Auscitrus, the national budwood and seed scheme and more recently by variety managers of PBR material from overseas breeding and selection programs. A recent trend is the inclusion of local mutations identified by citrus farmers and worthy of rapid evaluation to help determine commercial potential. Australia has seen natural citrus mutations such as Lane Late navel and a group of late navels which include Powell and Chislett navels become commercial varieties internationally. Since 2011 a range of new local mutations have entered the evaluation program with more identified to be included in 2017. Navelina mutations such as M7 and FJ navel are new early season selections along with an early Washington navel with olive skin and low fruit acid content. Other navel oranges include a later maturing selection of the red fleshed Cara Cara and smoother skinned variety named Sunsmooth. Mandarin selections under evaluation include Summerina, Royal Honey Murcott (RHM) and Nova variants which will be included in 2017. The national evaluation program aims to provide independent data to the Australian industry to allow more informed decisions when redeveloping to new varieties.

Financial support: HIA, ACIAR.

Keywords: varieties; evaluation; natural mutation.

S17-208

BIOMETRIC EVALUATION OF CULTIVARS OF ORANGE UNDER DIFFERENT ROOTSTOCKS IN THE SEMIARID CEARÁ, BRAZIL

Bastos DC, Sombra KES, Andrade HM, Santos Filho LG & Passos OS

Embrapa Semiárido, Petrolina, PE, Brazil; Instituto Federal do Ceará (IFCE), Limoeiro do Norte, CE, Brazil;
e-mail: debora.bastos@embrapa.br

Citriculture is important in national development, presenting as vulnerability to low diversification of rootstocks. This work evaluated the initial development of cultivars of orange in different rootstocks in the semi-arid of Ceará. It was used a completely randomized design (IHD), with three cultivars (Pera D-6, Valencia Tuxpan and Rubi) and three rootstocks (Santa Cruz Rangpur lime, Indio citrandarin and

Riverside citrandarin), totaling nine treatments. Were transplanted four repetitions per treatment in the Vertisol Hydromorph Órtico Typical (SiBCS), spaced 5 x 2 m. It was evaluated if height (H), diameter between plants and between rows (DL and Dr), canopy volume (V3) and the stem diameter 5 cm above and below the grafting, performing biometrics to 18, 24 and 30 months after transplanting. Variance analysis were performed and means were compared by Tukey test 5%. The treatments, T1S1-Pera D-6 x Santa Cruz Rangpur lime and T2S2-Valencia Tuxpan x Citrandarin Indio, differ significantly regarding the height and volume of cup at 18 and 30 months, listing respectively to: height: T1S1=1,20 m and 1,75 m, T2S2=1,29 m and 1,84 m; canopy volume: T1S1=0,90 m^3 and 2,56 m^3, T2S2=0,87 m^3 and 2,77 m^3. The Combinations Pera D-6 x Santa Cruz Rangpur lime and Valencia Tuxpan x Indio citrandarin presented better adaptation and vegetative development in conditions of semi-arid, recommending adoption in these conditions.

Financial support: Embrapa.

Keywords: biometrics; citrus; diversification.

S17-209

INITIAL DEVELOPMENT OF TAHITI ACID LIME UNDER DIFFERENT ROOTSTOCKS IN THE SEMIARID CEARÁ, BRAZIL

Bastos DC, Sombra KES, Loureiro FLC, Silva ACC & Passos OS

Embrapa Semiárido, Petrolina, PE, Brazil; Instituto Federal do Ceará (IFCE), Limoeiro do Norte, CE, Brazil;
e-mail: debora.bastos@embrapa.br

The Tahiti acid lime is the most planted in the Northeast. The work aimed to verify the initial development of nuclear clone of CNPMF-01 Tahiti acid lime on different rootstocks in the semi-arid. The experimental design was completely randomized (IHD), using the CNPMF-01 nucelar clone onto different rootstocks (treatments): T1-Santa Cruz Rangpur lime; T2-Sunki Tropical tangerine; T3-Indio citrandarin; T4-Riverside citrandarin; T5-Swingle citrumelo, transplanting into four seedlings per treatment in the Vertisol Hydromorph Órtico Typical (SiBCS), spaced 5 x 4 m. It was evaluated the height (H), diameter between plants and between rows (DL and Dr), canopy volume (V3) and the stem diameter 5 cm above and below of grafting, performing biometrics to 18, 24 and 30 months after transplanting. Variance analysis were performed and means were compared by Tukey test 5%. The treatments T1 and T4 showed the best results during the assessment, reaching the following final values: height: T1=2.12 m and T4=2.12 m, diameter between plants: T1=3.53 m and T4=3.17 m, diameter between lines: T1=3.63 m and T4=3.17 m, canopy volume: T1=14.40 m^3 and T4=11.29 m^3, stem diameter: T1=104.40 mm and 114.16 mm, T4=80.76 mm and 74.56 mm. The rootstocks Riverside citrandarin and Santa Cruz Rangpur lime induced higher adaptation and vegetative development to clone of CNPMF-01 Tahiti acid lime as reported in the literature, the Swingle citrumelo led to lower results.

Financial support: Embrapa.

Keywords: biometrics; citrus; diversification.

S17-219

CHARACTERIZATION OF DIFFERENT VARIETIES OF CITRUS FRUIT FOR JUICE IN THE SOUTH OF SPAIN

Hervalejo A, Casado G, Romero-Rodríguez E, González-Chimeno B & Arenas-Arenas FJ

IFAPA Las Torres-Tomejil, Consejería de Agricultura, Pesca y Desarrollo Rural, Junta de Andalucía, Spain;
e-mail: fjose.arenas@juntadeandalucia.es

At worldwide level, Spain is the sixth country producer and leading exporter of citrus, with a production mainly fresh market-oriented. Considering the difficult situation of current market, saturated and globalized, to allocate the Spanish production to the processing of refrigerated juices is contemplated as an interesting strategy of diversification of production, keeping in mind their competitive advantage in terms of quality compared to the others competitors (from Brazil and Florida refrigerated juices) and proximity to the major consumer of juices (Europe). However, citrus fruits destined for industry sector requires a conceptual and structural reform from the farm where you bet by varieties with high quality (high yield in juice and high sugar content), where the continuous emergence of interested oranges varieties destinated to transformation industry is presented as an opportunity for the sector. This paper presents the results of a field test of eleven varieties: two recognized tradition in the Spanish juice industry (Salustiana and Cadenera), five introduced in Spain and from other countries (Ambersweet, Dahong, Hamlin, Pera, Shamouti and Valencia Rhode Red) and other three more varieties obtained recently (Barberina, Midknight and Valencia Delta Seedless), regarding to the production, optimum time to collect and quality of fruits in edaphic and climatic conditions in the South of Spain. Among the earliest varieties, stood out Salustiana as the variety with the better characteristics in terms of productivity and fruit internal quality, while as later variety stood out Valencia Delta Seedless as most productive although in slightly lower quality variety to Barberina or Midknight.

Keywords: juice; varieties; agronomic behavior.

S17-224

PLANT GROWTH, PRODUCTION EFFICIENCY AND FRUIT QUALITY OF CITRUS CULTIVARS ONTO DWARFING ROOTSTOCK

Carvalho WSG, Marinho CS, Amaral BD, Sousa MC & Silva MPS

UENF, RJ, Brazil; e-mail: waleska_sgc@hotmail.com

In the fresh fruit market there is greater demand for the quality of the fruit. The aim of this study was evaluate the reduction of size, production efficiency and fruit quality of citrus cultivars grafted onto Flying Dragon trifoliate orange (FD). Randomized blocks designs were used, in a factorial scheme, with five canopy cultivars and two rootstocks. Canopy cultivars were evaluated in combinations with FD and