CALIFORNIA 2001 ANNUAL REPORT OF NC-140 COOPERATIVE REGIONAL PROJECT

PROJECT: **NC-140, California**

COOPERATING AGENCIES AND PRINCIPAL LEADERS:

R. Scott Johnson, Steve Southwick and Ted DeJong, University of California, Department of Pomology, Davis, CA 95616

Objective 1. ROOTSTOCK – ENVIRONMENT INTERACTIONS

PROGRESS OF THE WORK AND PRINCIPAL ACCOMPLISHMENTS

1999 Fuji Apple Rootstock Planting

Fireblight was not nearly the problem in 2001 as it was in 2000 when we lost the central leaders in over a third of the trees. There were a few minor strikes in some of the trees which had to be cut out. Overall, the trees grew and fruited well and we were successful at retraining central leaders in most of the trees. There were no new tree deaths in 2001 and all the trees appeared healthy. However, 3 border Gala trees died during the year. Two were on M9 and one on M26. The trees are starting to separate out in size as measured by tree height and trunk circumference (Table 1). In the dwarf planting, Supporter 1, 2 and 3 are the smallest and are significantly smaller than M9, while CG13 is the largest, significantly larger than M26. In the semi dwarf planting Supporter 4 and CG707 are the smallest and similar in size to M26 while CG210 is the largest, substantially larger than M7 (Table 1).

The trees flowered abundantly in 2001 with most trees having close to 200 clusters per tree. CG935 stood out from the others with an average of 374 clusters. This translated into significantly higher yields even though attempts were made to thin all trees to similar fruit loads. Since average fruit weight and tree growth were both better than average, it suggests CG935 shows promise as a productive dwarfing rootstock under California conditions.

In the semi dwarf planting, CG30 (both N and T) appears to have the greatest potential as a productive rootstock. It had over 3 times the yield of either M26 or M7 with comparable fruit size (Table 1). After 3 years of growth, CG30 is similar in tree size to both M26 and M7.

Root suckering was not a problem in any of the experimental rootstocks in 2001 (data not shown). Only M7 had more than a random sucker. Of the six M7 trees, five had suckers and the average was nearly six per tree.

2001 Red Top Peach Rootstock Planting

On March 16, 2001 eight reps of fifteen rootstocks with Red Top as the scion variety were planted at the Kearney Ag Center. No year end data have been collected yet but tree growth across the field was obviously quite variable. Some trees are vigorous and over 6 feet tall, while others are small and very weak looking. Part of this is because tree size at planting was also quite variable.

Related Rootstock Work

Peach rootstock breeding and evaluation studies. We have been conducting physiological studies on 4 rootstocks that appear to have promise as dwarfing stocks for peaches and nectarines. These include the very dwarfing K146-43 and K146-44 selections and the semi dwarfing Hiawatha and P30-135 stocks. Comparisons were always made with the standard vigorous Nemaguard rootstock. Results have shown that all the rootstocks have similar productivity when measured on a canopy light interception basis but the more dwarfing stocks tend to have better fruit quality. Detailed analysis of diurnal water potentials and root hydraulic conductivities suggest water relations can explain the dwarfing mechanism in these rootstocks.

The peach rootstock breeding program includes a large number of selections from a wide array of crosses. In 2001, several of these with O'Henry peach grafted on top looked to be extremely promising. The trees ranged in size from very dwarfing to semi dwarfing and all had excellent fruit size. More than 20 of these have been identified for more extensive replicated studies.

WORK PLANNED FOR NEXT YEAR: Data collection and rootstock evaluation will continue in 2002 following guidelines established by the NC-140 Technical Committee.

Table 1. 1999 NC-140 Fuji apple rootstock planting established at the Kearney Ag Center – 2001 data.

Rootstock	Tree Height (cm)	Trunk Circ. 10/01 (mm)	Flower Clusters/Tree (#)	Yield (kg/tree)	Ave. Fruit Weight (g/fruit)
Dwarf Planting					
Supporter 1	257 de[z]	143 g	221 bc	4.5 c	135 d
Suuporter 2	270 de	153 fg	238 bc	5.5 bc	139 cd
Supporter 3	250 e	154 fg	188 c	5.2 bc	139 cd
CG41	288 cd	172 ef	204 c	6.9 bc	141 b-d
M9T337	323 b	183 de	292 b	8.4 bc	146 a-d
CG179	340 ab	173 ef	187 c	8.0 bc	151 a-c
G16N	318 bc	198 cd	191 c	7.8 bc	141 b-d
CG202	334 b	204 bc	186 c	8.2 bc	139 cd
M26EMLA	329 b	221 b	187 c	5.2 bc	146 b-d
CG935	343 ab	207 bc	374 a	12.7 a	154 ab
G16T	314 bc	213 bc	185 c	8.9 b	160 a
CG13	372 a	261 a	239 bc	8.0 bc	142 b-d
Semi Dwarf Planting					
M26EMLA	302 bc	204 bc	76 b	2.6 c	152[y]
Supporter 4	304 bc	190 c	169 a	4.6 bc	170
CG707	301 bc	206 bc	114 ab	3.1 c	159
M7EMLA	271 c	209 bc	120 ab	2.1 c	149
CG814	318 ab	218 b	177 a	4.7 bc	152
CG30N	314 ab	211 bc	177 a	8.8 a	152
CG30T	330 ab	225 b	166 a	6.9 ab	157
CG210	350 a	281 a	203 a	5.5 a-c	167

[z]Mean separation within columns for each planting by Duncan's multiple range test, P=0.05.
[y]Columns with no letters indicate no significant differences.