

# Compatibility and Field Performance of ‘Deep Purple’, ‘Hiawatha’, and ‘Marianna 2624’ Plum, and Other Rootstocks for Almonds

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## Background

The USDA Agricultural Research Service has identified various plum type rootstocks which are reported to show varying degrees of compatibility with Nonpareil. One of these, ‘Deep Purple’ (DP) (*Prunus besseyi* x *p.salicina*) has also shown resistance to root knot and root lesion nematodes in field trials near Fresno. One of the most commercially important characteristics of plum root, tolerance of oak root fungus, is unknown. Another promising candidate is ‘Hiawatha’, also a plum type rootstock with similar parentage and characteristics. Researchers in France (INRA) have developed numerous peach/almond hybrid rootstocks with other desirable characteristics, such as tolerance to drought, high pH soils and nematodes, and which impart increased vigor to the scion. The most successful of these, ‘GF 677’, is planted widely throughout Europe and Australia but has yet to be evaluated under California conditions. Finally, many newly released almond varieties have not been fully evaluated for compatibility on ‘Marianna 2624’.

Our objectives are to evaluate the compatibility and field performance of selected almond varieties on three plum rootstocks; ‘Marianna 2624’, ‘Deep Purple’

and ‘Hiawatha’ and one peach/almond hybrid rootstock, ‘GF 677’.

Also under evaluation are the tolerance of ‘Deep Purple’ plum to heavy, poorly drained soil and enhanced compatibility provided by a Padre interstem in between Nonpareil and M2624 root.

At the Green Bay orchard of Nickels, ‘Nonpareil’ trees grafted on ‘Deep Purple’ were provided by two nurseries, Fowler (Non F) and Burchell (Non B). ‘Nonpareil’ on ‘M2624’, and, ‘Butte’ and ‘Nonpareil’ on ‘Hiawatha’ were also included. Additional evaluations of the newly developed cultivars, ‘Durango’ (Fowler) and ‘Kochi’ (Sierra Gold) on ‘Lovell’ were planted. The new varieties on ‘M2624’ included ‘Plateau’ (?), ‘Winters’ (UC 13-1), and ‘Avalon’ (Burchell). Varieties planted as standards on ‘M2624’ were ‘Sonora’ and ‘Mission’.

## Results

Trees were evaluated in October 2001 after the second growing season to determine survivability and to rate tree size. The following table shows trunk circumference and the general performance of the scion rootstock combinations. Note that all ‘Nonpareil’ on ‘Deep Purple’ have died, as

well as 55% of all ‘Mission’ on DP rootstock. Similar poor performance was found at Nickels in a 1998 evaluation of ‘Nonpareil’ on ‘Deep Purple’. We can now conclude that ‘Deep Purple’ is not graft compatible with ‘Nonpareil’. ‘Deep Purple’ will not serve as a commercially viable plum rootstock for ‘Nonpareil’.

‘Marianna 2624’ compatibility results are just beginning to emerge. ‘Nonpareil’ on ‘Marianna 2624’ is starting to fail as is the ‘Plateau’ variety. Several ‘Plateau’ on ‘M

2624’ have died and the remaining trees appear weak. ‘Nonpareil’ trees on a ‘Padre’ interstem on ‘Marianna 2624’ are all growing well. ‘Avalon’ and ‘Winters’ (UC 13-1) are currently performing well on ‘M 2624’ although they are still young trees. Both of the ‘Sonora’ and ‘Mission’ standards look acceptable. Results are also promising for ‘Nonpareil’ and ‘Butte’ on the new plum rootstock, ‘Hiawatha’. Similar field tests near Fresno involving peach scions show good compatibility on ‘Hiawatha’ which also supports the long-term potential of ‘Hiawatha’ plum for ‘Nonpareil’.

**Plum Type Rootstocks - 2001 Trunk Circumference (cm).**

<u>Scion / Rootstock</u>	<u>Percent Mortality</u>	<u>Mean Circumference</u>
Mission / Marianna 2624	0	15.3
Sonora / Marianna 2624	0	16.6
Avalon / Marianna 2624	0	14.9
Plateau / Marianna 2624	33.3 (3/9)	13.4 *
Winters / Marianna 2624	0	15.9
Nonpareil (F) / Marianna 2624	44.4 (4/9)	14.3 *
Mission / Deep Purple	55.6 (5/9)	14.0 *
Nonpareil (F) / Deep Purple	100.0 (all)	**
Nonpareil (B) / Deep Purple	100.0 (all)	**
Nonpareil / Padre / Marianna 2624	0	17.6
Butte / Hiawatha	0	18.4
Nonpareil (F) / Hiawatha	0	17.0

\* Dead trees in plot not included in means.

\*\* All trees in plot are dead

As expected, all ‘Nonpareil’ and ‘Butte’ trees on ‘GF677’, ‘Hansen 536’, and ‘Lovell’ rootstocks have continued to grow well this season. ‘Kochi’ on ‘Lovell’ is also growing well. However, ‘Durango’ on ‘Lovell’ appears to be lower in vigor than the others.

This compatibility evaluation should continue for at least five more seasons before reliable conclusions can be drawn.

NicRac DP Hiawatha rpt 01

