Progressive Genetics Group™

Advanced clonal rootstocks for tomorrow's orchardists

Krymsk® 86

(cv. AP 1) USPP#16,272

Krymsk® 86 is a very promising hybrid rootstock, especially for almond growers. It has repeatedly shown superior anchorage relative to all other rootstocks, including peach/almond hybrids. For almonds, the vigor and productivity of Krymsk® 86 are similar to Lovell. The soil adaptation is quite broad, including soils considered too wet for Lovell. Krymsk® 86 should not be used in soils prone to Rootknot Nematode infestation, nor where high Ring Nematode populations have been detected.

Krymsk® 86 is a peach/plum hybrid which has Nonpareil almond compatibility (oldest trees planted in 2004). No almond varieties have been found incompatible. Almond yields have been measured for Nonpareil, Butte, Monterey, Fritz, Winters and Carmel, with yields all similar to Lovell. Krymsk® 86, with superior anchorage and wet soil tolerance, has demonstrated better survival than Lovell rootstock in many cultural situations.

The root system for Krymsk® 86 spreads very widely relative to Lovell and Nemaguard. In addition, individual roots possess amazingly high tensile strength, resulting in stronger roots and superior anchorage. Lovell roots are typically brittle and lack the lateral spread of Krymsk® 86 roots. Because the Krymsk® 86 root system spreads widely, the irrigation system must wet a wide area.

PARENTAGE: Prunus cerasifera x Prunus persica (Myrobalan plum x Peach)

ORIGIN: Krymsk Experimental Breeding Station, Krasnodar Region, Russia.

OLDEST TEST SITES IN THE US: 2003 planting in Colorado, 2003 in California, 2005 in Washington.

COMPATIBILITY: Almonds, peach, plum (European and Japanese), and apricots. Almond cultivars tested are Nonpareil since 2004, Monterey, Butte , Carmel and Fritz since 2005; Winters since 2006. Apricot Cultivars tested are Apache, Robada and Orangered for 6 years. Numerous peach cultivars tested for 2 to 5 years. Numerous peach cultivars tested in Russia for 15 years. Plum compatibility testing is in progress. French compatibility tested since 2009

VIGOR: With almonds, expect 95% of Lovell in the Sacramento Valley.

GROWTH UNIFORMITY: Excellent.

ROOTSTOCK INDUCED TREE FORM: Similar to slightly more upright than Lovell.

ANCHORAGE: Excellent for both young and mature trees. Older tree anchorage is unknown.

YIELD EFFICIENCY: With almond, yield efficiency is similar to Lovell and Nemaguard in good peach soils. Yield efficiency needs to be determined, relative to peach rootstocks, in marginal peach soils.

SUCKERING: Produces a few trunk and root suckers but much less than Marianna 2624.

CHILLING REQUIREMENT: Appears to be slightly higher than Marianna 2624.

COLD HARDINESS: Based on experience in Russia, should be hardy in all major growing areas of the US.

NEMATODE RESISTANCE: None. Rootknot and Lesion nematode susceptibility similar to Lovell. Ring nematode susceptibility appears similar to Nemaguard, although more testing is needed.

EFFECT OF ROOTSTOCK ON BACTERIAL CANKER SUSCEPTIBILITY: Similar to Nemaguard.

OAK ROOT FUNGUS TOLERANCE: Tolerant. In-vitro testing shows Krymsk® 86 to be more tolerant than Marianna 2624.

PHYTOPHTHORA SENSITIVITY: Much less sensitivity than Lovell, Nemaguard and peach/almond hybrids.

VERTICILLIUM RESISTANCE: Slightly susceptible, but much less susceptible than Lovell.

ASPHIXIA TOLERANCE: Spain has seen tolerance. The soils are quite heavy in the Russian region where Krymsk® 86 rootstock was developed. Needs more testing in US.

DROUGHT TOLERANCE: Better than peach. Reported to be high in Russia.

CROWN GALL SUSCEPTIBILITY: Susceptible. Level of susceptibility is not extreme, but very little crown gall has been observed in orchards. Possibility of Crown Gall infection can be diminished with proper sanitation during root sucker removal

HIGH PH TOLERANCE: Better than Lovell or Nemaguard. Needs more testing in conditions common in California and other areas of the U.S.

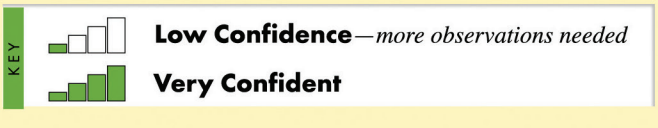
CALCAREOUS SOIL TOLERANCE: Reported in Spain to be good. Productive in calcareous soils of western Colorado.

NO. CALIF. REPLANT DISORDER SUSCEPTIBILITY: Similar to Lovell.

MONTEREY AND "YCL": In some heavy soil orchards with Nonpareil and Monterey on Krymsk® 86 rootstock, some young trees may stop growth and develop yellow, cupped leaves (YCL). Heavy rainfall or excess irrigation in spring months can leave orchard soils highly saturated. Trees affected with YCL are usually in sites with very wet or very dry soils in spring.

Much lower and less severe YCL amounts have been observed on Nonpareil. Nonpareil trees typically recovers healthy green growth over the course of the growing season. Many Monterey trees recover healthy growth, but at a lower percentage than Nonpareil. For Monterey trees on Krymsk® 86, the root anchorage advantage clearly outweighs the small number of trees with delayed growth due to YCL.

How confident are we in this information?



Krymsk®86 Rootstock (cv. AP 1) USPP#16,272

The Russian Rootstock™

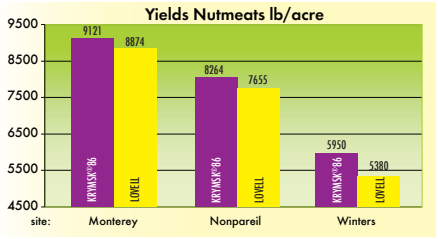
- Outstanding Anchorage
- Productive in Well-drained & Wetter, Heavier Soils
- Strong Yields with Moderate Vigor
- Tolerates Oak Root Fungus

Cumulative Almond Yields on Krymsk®86 Rootstock

Williams

Tree Spacing 15 x 14 — LBS. NUTMEAT/ACRE

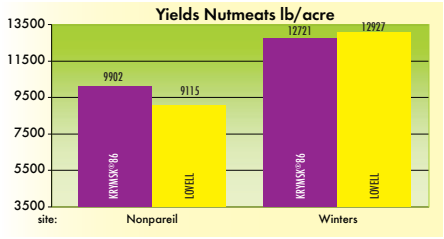
Rootstock	Variety	Ave. Kernel Weight (g)	3rd	4th	5th	6th	Cum. Yield
Krymsk®86	Monterey	1.51	—	3147	3429	2546	9121
Lovell	Monterey	1.38	—	3403	3709	1762	8874
Krymsk®86	Nonpareil	1.15	2927	—	2588	2749	8264
Lovell	Nonpareil	1.13	2478	—	2766	2411	7655
Krymsk®86	Winters	1.11	—	2651	—	3299	5950
Lovell	Winters	1.06	—	2203	—	3177	5380



Maxwell

Tree Spacing 16 x 22 — LBS. NUTMEAT/ACRE

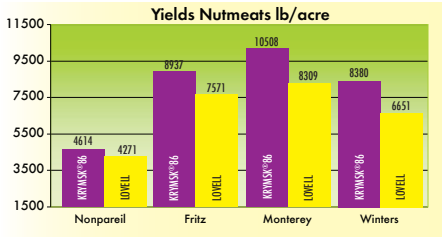
Rootstock	Variety	Ave. Kernel Weight (g)	4th	5th	6th	7th	8th	9th	Cum. Yield
Krymsk®86	Nonpareil	1.17	1825	2151	2154	1533	[2727]	2240	9902
Lovell	Nonpareil	1.13	1844	2515	1592	1410	—	1754	9115
Krymsk®86	Winters	0.99	2304	2231	—	2145	2411	3630	12721
Lovell	Winters	1.04	2289	2978	—	2814	2195	2651	12927



Colusa County

Tree Spacing 16 x 24 — LBS. NUTMEAT/ACRE

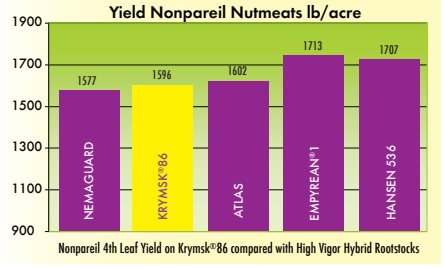
Rootstock	Variety	Ave. Kernel Weight (g)	4th	5th	6th	7th	Cum. Yield
Krymsk®86	Nonpareil	1.11	—	2112	2502	—	4614
Lovell	Nonpareil	1.03	—	2071	2200	—	4271
Krymsk®86	Fritz	0.93	2605	1841	2722	1769	8937
Lovell	Fritz	0.91	2215	1523	1954	1880	7571
Krymsk®86	Monterey	1.23	3357	2403	2402	2346	10508
Lovell	Monterey	1.27	3197	1756	1540	1815	8309
Krymsk®86	Winters	0.95	2393	2191	1447	2349	8380
Lovell	Winters	0.95	1900	1457	1400	1895	6651



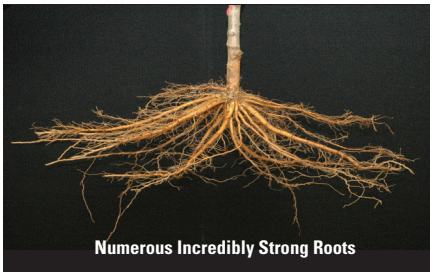
4th Leaf Nonpareil Yield Kern County

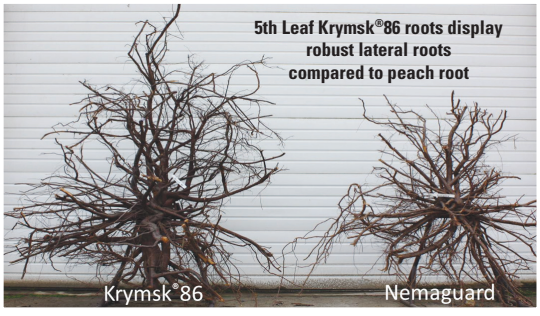
Tree Spacing 16 x 22 — LBS. NUTMEAT/ACRE

Rootstock	4th
Nemaguard	1577
Krymsk®86	1596
Atlas	1602
Empyrean®1	1713
Hansen 536	1707



Nonpareil 4th Leaf Yield on Krymsk®86 compared with High Vigor Hybrid Rootstocks





P2G™