

## 'Sundrop' Apricot

CHERYL R. HAMPSON<sup>1</sup>

'Sundrop' apricot was introduced by W.D. Lane of the Agriculture and Agri-Food Canada research facility in Summerland, British Columbia (BC) in 1975. Originally tested as S-4E-55-9, 'Sundrop' was selected by K.O. Lapins in 1956 (17). It is an open-pollinated seedling of 'Perfection', and its main attributes are firmness, attractive color, uniformity of ripening and good hardiness of flower buds and wood (17).

'Perfection', the seed parent of 'Sundrop', is a chance seedling introduced in 1937 (30). Although somewhat lacking in flavor, 'Perfection' apricots are large and firm, with bright orange flesh, and the trees have good wood hardiness (30). The fruit ships well and has been popular for roadside sales in BC.

Climatic adaptation is a major problem in apricot breeding, with most cultivars only performing well in specific geographic or climatic conditions (6). 'Sundrop' is no exception. It has no commercial importance in the major producing countries of the Mediterranean basin, nor in Asia or California. 'Sundrop' was approved for commercial production in New York State (15), southern Moravia (27) and BC, Canada, but it is not an important cultivar in any of these areas. 'Sundrop' found its greatest commercial acceptance in New Zealand, where it was at one time the most widely planted apricot cultivar (13), and even today is second only to 'CluthaGold' in importance (Mike Malone, fruit breeder, HortResearch, New Zealand, personal communication). This fact is less surprising than it appears initially.

The Central Otago of New Zealand and the Okanagan Valley of BC both enjoy a semi-arid climate with hot dry summers and cold winters (7). Soils in both regions are coarse-textured, frequently shallow, low in organic matter and near neutral pH. Zinc and boron deficiencies are common.

'Sundrop' fruit have outstanding appearance and firmness when properly managed. The skin is bright orange with a clean finish, and the flesh is deep orange throughout (17). Color develops before the fruit are mature, whereas flavor development comes later, close to optimum maturity. The freestone fruit are round, and firmer than 'Wenatchee'. Fruit contain about 10% Brix and 0.9% titratable acidity (16). Most of the pits contain a single seed (23). The kernels are high in cyanide: 177 mg per 100g compared to 12 mg per 100 g for 'Moorpark' (29). Fruit size is only medium (*ca.* 63 g), and is a limitation to fresh market sales in competition with larger cultivars. Although fruit size can be increased by certain management practices, larger fruit (over 5 cm) tend to be softer, yellower, and susceptible to nose-end splits (A. Barkwill, Summerland, BC, apricot grower, personal communication).

'Sundrop' has more uniform fruit maturity than 'Wenatchee' but three or four picks are typical. Fruit matures early, about July 28 in Summerland, BC (16), well before 'Blenheim' or 'Tilton' (17), but after 'Tomcot' or 'Goldbar' (A. Barkwill, personal communication). It can be susceptible to stem end tears at harvest,

<sup>1</sup>Agriculture and Agri-Food Canada, Pacific Agri-Food Research Centre, P.O. Box 5000, Summerland, BC, Canada V0H 1Z0. E-mail: [hampsonc@agr.gc.ca](mailto:hampsonc@agr.gc.ca)

but the causative factors are unknown (A. Barkwill, personal communication).

'Sundrop' is recommended for fresh market and roadside sales, purees or home canning. It is not rated high for commercial canning, being less attractive and flavorful than 'Tilton' after processing (17). In pilot-plant scale canning trials of 27 cultivars in Greece, 'Sundrop' suffered higher weight losses during the destoning and peeling steps than the Greek commercial standard 'Bebecou' (18). In taste tests done as part of the same study, 'Sundrop' scored in the lower half of 27 cultivars, particularly in texture of the canned product. However, it was fairly low in phenolic compounds that contribute to browning.

The fruit store well (13). In New Zealand, 'Sundrop' can be stored successfully in cold air storage for up to 3 or 4 weeks, but they do not store well past that point in either air storage or modified-atmosphere packaging (21). Sholberg et al. (28) obtained complete prevention of brown rot (*Monilinia fructicola* (G. Wint.)) infections in tree-ripened 'Sundrop' apricots by fumigating fruit with red wine vinegar after inoculation. No phytotoxicity symptoms occurred, and the authors suggested it as an alternative to hypochlorite treatment. New Zealand flower thrips (*Thrips obscuratus* (Crawford)), a quarantine pest for export of fruit from New Zealand, were eliminated by treating the fruit with hot water, without any adverse effects on fruit quality (24).

'Sundrop' trees are medium to large, vigorous and spreading (17). Summer pruning is recommended for improving light penetration when grown on the Tatura trellis (1). New Zealand reports note that 'Sundrop' tends to have long extensions of primary and secondary branches without laterals (9). Under conventional tree training in BC, some growers find that shortening the long horizontal shoots about 5-6 weeks after full bloom

(90-120 cm of new growth) can be useful for inducing formation of lateral branches with flower buds (A. Barkwill, personal communication). The trees are more productive than 'Blenheim' or 'Tilton' (16,17). Given good light penetration and adequate fruit thinning, 'Sundrop' trees are more regular bearing than 'Blenheim' or 'Tilton' (A. Barkwill, personal communication).

'Sundrop' has good wood and flower bud hardiness. In BC, the wood hardiness is better than 'Blenheim' or 'Tilton' (17). The flower buds are hardier than those of 'Blenheim' and equal to 'Tilton'. The chilling requirement of flower buds may vary with shoot type. Flower buds on spur shoots required less than 400 chilling units, whereas over 1000 chilling units were needed on vigorous extension shoots on the same trees in New Zealand (3).

'Sundrop' blooms early in the apricot blossom season (before 'Tilton'). 'Sundrop' has fertile pollen but is self-incompatible (17) and requires a nearby pollinizer with synchronous bloom to get good fruit set. As few as 3% pollinizers in a solid block of 'Sundrop' were sufficient for satisfactory fruit set (23).

'Sundrop' pollination requirements were studied in detail in New Zealand. Self-incompatibility was temperature-dependent, and could be overcome at 20°C, but this condition was rarely met in the field at bloom (22). 'Sundrop' flowers have a high volume of nectar (4), but lower stigma receptivity and a faster decline of receptivity over time than other cultivars studied (23). 'Sundrop' was cross-compatible with 29 out of 32 cultivars tested (23). Only 'Kecksei Rosza', 'Summerjoy' ('Pui Sha Sin') and 'Monaco Bello' were incompatible. Pollen of 'San Castrese', 'Goldrich', 'Stepnizak', 'Zard', 'Skaha', 'Harcot' and 'Goldstrike' all gave good to excellent fruit set on 'Sundrop' in controlled pollination tests. In New Zealand, 'CluthaGold',

'CluthaStar', 'CluthaSun' and 'CluthaGem' are all good pollinizers for 'Sundrop' (20). 'Sundrop' itself seems to be a good pollinizer for 'Hargrand' (Dr. E. Hogue, Agriculture and Agri-Food Canada research scientist, retired, personal communication).

'Sundrop' is comparable to 'Tilton' or 'Blenheim' in disease and pest resistances in BC. Conflicting results have emerged from Europe on plum pox virus (sharka) resistance. Severe leaf and fruit symptoms were reported on 'Sundrop' in Greece (12) and Romania (5). Other studies suggest it has moderate resistance (14), but is not immune like 'Harlayne' when deliberately inoculated (11,14). In Romania, 'Sundrop' was resistant to an *Alternaria* infection that arose as a secondary pathogen after repeated use of benzimidazole fungicides (26).

'Sundrop' is grown successfully on apricot seedling roots in BC, and on 'Golden Queen' peach or myrobalan plum seedling rootstocks in New Zealand. All of these produce large trees, and a number of studies have focused on various means of vigor control to permit high density planting and/or reduce ladder work.

In an extensive rootstock trial, the best performing rootstocks for 'Sundrop' in New Zealand were Marianna 6.64, Marianna GF 8/1, 'Golden Queen' peach, 'Zailisky' apricot, Pixy and Marianna 9.52 (13). Some of these also advanced or compressed harvest. The smallest of these trees (on Marianna 9.52) were semi-dwarf. Smaller trees tended to have smaller fruit. Tree survival was poor on Marianna 9.6, Marianna 6.46, INRA GF43, P.S.A. 5 (wild peach seedling), and P1609 (myrobalan  $\times$  peach hybrid), either from graft incompatibility or *Pseudomonas* infection. Graft incompatibility was also suspected to underlie the poor performance of 'Sundrop' on M800 (*Prunus besseyi*  $\times$  *P. sibirica*) (10).

Paclobutrazol, mechanical root pruning and deficit irrigation were tested to control

vigor in a high density apricot block in New Zealand (2). All treatments reduced vegetative growth. Paclobutrazol advanced flowering and both paclobutrazol and root pruning advanced maturity. A single trunk drench of paclobutrazol significantly reduced vegetative growth of the scion for three years in another study, without changing yield, fruit size, or fruit firmness (9). However, it increased limb bareness.

'Sundrop' trees can be grown with vase, Tatura, central leader or Spanish bush training systems (2,8,10,13). Spanish bush training reduced fruit size slightly relative to central leader, but substantially reduced tree height and ladder work, without reducing yield (10).

'Sundrop' progenies tend to be early ripening, precocious, early blooming, large-fruited and firm (25). New Zealand breeders released six cultivars in the Clutha series, all of which resulted from the cross 'Moorpark'  $\times$  'Sundrop' or its reverse (19). All were selected for attractive appearance, good handling and resistance to *Pseudomonas* and silver-leaf (*Chondrostereum purpureum* (Pers.:Fr.) Pouzar) (19). 'CluthaGold' of this series is now the most widely planted apricot in New Zealand (M. Malone, personal communication). A newer generation (all open-pollinated seedlings of Clutha series cultivars) is now available: 'Vulcan', 'Gabriel', 'Dunstan', 'Benmore' and 'Alex' (8). These new cultivars have a variety of interesting traits and harvest dates up to 25 days after 'Sundrop'.

### Literature Cited

1. Arzani, K., D. Wood and G.S. Lawes. 2000. Seasonal vegetative and fruit growth pattern of mature close-planted 'Sundrop' apricot trees grown under humid climate. *Acta Hort.* 514: 295-300.
2. Arzani, K., D. Wood and G.S. Lawes. 2000. Influence of first season application of paclobutrazol, root-pruning and regulated deficit irrigation on second season flowering and fruiting of mature 'Sundrop' apricot trees. *Acta Hort.* 516: 75-82.
3. Austin, P.T., T.A. Atkins, J.A. Plummer, D.A. Noiton

- and E.W. Hewitt. 1992. Influence of shoot-type on time of apricot flowering. *Acta Hort.* 313: 325-330.
4. Austin, P.T., E.W. Hewett, D.A. Noiton and J.A. Plummer. 1996. Cross pollination of 'Sundrop' apricot (*Prunus armeniaca* L.) by honeybees. *N.Z. J. Crop Hort. Sci.* 24: 287-294.
  5. Balan, V. and E. Stoian. 1995. Susceptibility of certain apricot-tree varieties to the plum-pox virus pathogenic action. *Acta Hort.* 384: 565-59.
  6. Bassi, D. 1999. Apricot culture: present and future. *Acta Hort.* 488: 35-40.
  7. Buchanan, L. 1985. Apricot production in Central Otago, New Zealand. *Acta Hort.* 192: 113-121.
  8. Hofstee, M.E., M. Malone and C. Howard. 1999. Apricot breeding in New Zealand. *Acta Hort.* 488: 171-172.
  9. Jacyna, T. and K.G. Dodds. 1995. Some effects of soil-applied paclobutrazol on performance of 'Sundrop' apricot (*Prunus armeniaca* L.) trees and on residue in the soil. *N.Z. J. Crop Hort. Sci.* 23: 323-329.
  10. Kappel, F. 2003. Influence of pruning and interspecific *Prunus* hybrid rootstocks on tree growth, yield and fruit size of apricot. *J. Amer. Pomol. Soc.* 57(3): 100-105.
  11. Karayiannis, I. 1995. Reaction of apricot cultivars to plum pox virus infection. *Acta Hort.* 384: 571-574.
  12. Karayiannis, I., J.M. Audergon and B. Di Terlizzi. 1999. Susceptibility of apricot cultivars to plum pox virus. *Acta Hort.* 488: 753-759.
  13. Knowles, S.E., G.F. McLaren, P.G. Glucina and P. Alspach. 1994. Performance of 'Sundrop' apricot on 23 rootstocks. *N.Z. J. Crop Hort. Sci.* 22: 419-430.
  14. Kröka, B., I. Oukropec, J. Polák and P. Kominek. 2000. The evaluation of apricot (*Prunus armeniaca* L.) cultivars and hybrids resistant to sharka. *Acta Hort.* 538: 143-146.
  15. Lamb, R.C. and W.C. Stiles. 1983. Apricots for New York State. *New York Food and Life Sciences Bulletin* 100. 4pp.
  16. Lane, D. 1976. Two new apricots that are worth considering. *BC Orchardist* 16(2): 15, 19.
  17. Lane, W.D. 1978. Sundrop apricot. *Can. J. Plant Sci.* 58(3): 905-906.
  18. Mallidis, C., C. Katsaboxakis and I. Karayiannis. 1999. Suitability of apricot cultivars for canning. *Acta Hort.* 488: 593-599.
  19. McLaren, G.F. 1992. The 'Clutha' series of apricots. *Orchardist of New Zealand* 65(8): 26-27.
  20. McLaren, G.F. and J.A. Fraser. 1996. Pollination compatibility of 'Sundrop' apricot and its progeny in the 'Clutha' series. *N.Z. J. Crop Hort. Sci.* 24: 47-53.
  21. McLaren, G.F., J.A. Fraser and D.M. Burmeister. 1997. Storage of apricots in modified atmospheres. *Orchardist* 70(11): 31-33.
  22. McLaren, G.F., J.A. Fraser and J.E. Grant. 1995. Pollination compatibility of apricots grown in Central Otago, New Zealand. *Acta Hort.* 384: 385-391.
  23. McLaren, G.F., J.A. Fraser and J.E. Grant. 1996. Some factors influencing fruit set in 'Sundrop' apricot. *N.Z. J. Crop Hort. Sci.* 24: 55-63.
  24. McLaren, G.F., J.A. Fraser and R.M. McDonald. 1999. Non-chemical disinfestations of a quarantine pest on apricots. *Acta Hort.* 488: 687-690.
  25. Nicotra, A., J.B. Tian and L. Moser. 1993. Genetic analyses of characters of apricot seedlings. *Adv. Hort. Sci.* 7(2): 51-55.
  26. Oprea, M., V. Balan, E. Drăgoescu and A. Ivascu. 1985. Resistance of some apricot varieties and hybrids to *Alternaria tenuissima*. *Acta Hort.* 192: 231-238.
  27. Oukropec, I. 1999. Stabilisierung der Marillenerträge in Südmähren. *Mitteilungen Klosterneuburg, Rebe und Wein. Obstbau und Fruchtverwertung* 49(6): 227-229. (German with English abstract.)
  28. Sholberg, P., P. Haag, R. Hocking and K. Bedford. 2000. The use of vinegar vapor to reduce postharvest decay of harvested fruit. *Hortscience* 35(5): 898-903.
  29. Stoewsand, G.S., J.L. Anderson and R.C. Lamb. 1975. Cyanide content of apricot kernels. *J. Food Sci.* 40(5): 1107.
  30. The Brooks and Olmo Register of New Fruit and Nut Varieties, Third Edition. 1997. ASHS Press, Alexandria, VA, pp. 126-127.



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