

E. H. Wilson, Yichang, and the Kiwifruit

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The fruits are rounded to oval 1½–2 inches long, russet-colored and more or less hairy. The skin of the fruit is very thin and the flesh is green, sweet and pleasant to the palate and is excellent for dessert or for making a preserve.

E. H. Wilson
1915

So wrote E. H. Wilson of the fruit of *Actinidia chinensis* Planchon var. *hispida* C. F. Liang, the fruit known to the Chinese as the *yang tao* or *mihoutao* and now known to most of us as the Chinese gooseberry or kiwifruit. At the turn of the century, the kiwifruit was a wild plant in China, a very handsome climbing plant, ideal for pergolas, but only one of the many interesting new Chinese plants being brought into cultivation in Europe. By the 1950s it had become a useful fruiting plant grown in a few commercial orchards in New Zealand. The total plantings then occupied fewer than a hundred acres, and only small quantities of fruit were exported to the United Kingdom. In the early 1960s the first shipment of kiwifruit was sent to the United States. Orchardists in California began planting it soon after, when they discovered that the fruit produced in New Zealand was being sold in Los Angeles for remarkably high prices. By 1968 they had planted 15 acres.

Today the kiwifruit has become a horticultural success story. At the beginning of 1983, kiwifruit orchards covered over 20,000

acres in New Zealand, and that area is increasing by 3000 to 4000 acres annually. It is estimated that there are now over 6000 acres of the fruit in California. Plantings are being made in many other parts of the world also: France, Italy, Spain, Israel, Japan, South Korea, Chile, Australia, Zimbabwe, and South Africa.

In comparison to that of most other fruit crops, the history of the introduction of the kiwifruit is remarkably well-documented. By reading the accounts of the plant explorers, old gardening and horticultural journals, missionary records, and reports and files of government research stations, and by talking to older growers and nurserymen, we can trace almost every step in the domestication of the kiwifruit. We can follow it from its origin in China to its dispersal throughout the world and its development as an important horticultural crop.

The Kiwifruit in China

Accounts of the kiwifruit appear in many of the early Chinese texts. Indeed, it is sometimes suggested that the earliest references to it can be found in classics of over 2000 years ago. Identification of plants mentioned in such texts is notoriously difficult, however. Many of the descriptions are vague, the allusions poetic, and a single plant is some-

times referred to by the different names it had in different parts of China (worse, the same name is sometimes used for different plants). The first unequivocal descriptions of the kiwifruit date from the Tang dynasty (A.D. 618–907), and one poem indicates that cultivation of it may have begun about this time (Yan 1981). Cultivation cannot have been extensive, however, since most writers consistently describe the kiwifruit as being a wild plant, a plant of the mountains. At times the peasants would bring it to town to sell in the markets.

A kiwifruit orchard near Auckland, New Zealand. Tree ferns (*Cyathea* sp.) can be seen in the shelter belt at left.

European Discovery of the Kiwifruit

The first known collector of kiwifruit plants was Père Pierre Noel Le Chéron d'Incarville, a French Jesuit who spent 17 years at the Imperial Court in Beijing (Peking). He collected specimens (but no fruit) at Macao, soon after his arrival in China in late 1740. Incarville sent his specimens back to France but they remained there, ignored and undescribed, for over a century (Franchet 1882). The plant was formally described, and named *Actinidia chinensis*, in 1847 (Planchon 1847), based on specimens collected several years earlier by Robert Fortune, who had been sent to China by the Horticultural Society of London (Cox 1943). Fortune brought back dried specimens of kiwifruit





foliage and flowers but made no mention of the fruit. He probably had not seen fruit, as he had had only a few chances of traveling any distance from the main ports.

Towards the end of the 19th century, botanists and horticulturists in Europe and North America were becoming more aware of the variety and beauty of the Chinese flora and the fitness of many of the plants for temperate climates. This increased awareness was due in large part to the efforts of Augustine Henry, who spent 20 years in the service of the Chinese Maritime Customs. On his first tour of duty, from 1882 to 1889, Henry was stationed at Yichang (Ichang), a small port on the Yangtze River about a thousand miles inland and just downstream from the famed Yangtze Gorges.

Yichang had only a small European population, and life in such an outpost could be very lonely and dreary. Henry took up an interest in botany. "My collecting is my exercise, and it keeps me in health, bodily and mental; in these out-of-the-way posts, where stagnation is the rule" (Henry 1896). He was particularly interested in the economic uses of plants in China and in the origins of cultivated plants. His writings refer to the kiwifruit several times: "a climbing shrub which bears edible fruit about the size of a plum" (Henry 1887); "a very large climbing shrub with white conspicuous flowers and fruit about the size of a plum, which can be made into a good jam with a guava-jelly kind of flavour. This fruit might be much improved by cultivation" (Henry 1893); "produces in the wild state excellent fruit

about the size of a big plum . . . the fruit would be a great acquisition, I think" (Henry 1903). Henry encouraged and aided expeditions to collect seed and explore the flora of western China.

Wilson and the Introduction of the Kiwifruit to Europe

Of the various collecting expeditions, E. H. Wilson's had the greatest success. On his first two trips to China, Wilson was in the employ of James Veitch & Sons, the famous London nursery firm. Veitch's had sent a series of travelers abroad to collect plants suitable for the nursery trade. From 1840 to 1905 they almost always had at least one collector overseas in the botanically unexplored parts of the world, and a remarkable range of plants had thus been introduced to Great Britain (Veitch 1906; Fuller and Langdon 1973). James Herbert Veitch, one of the younger members of the family, had collected in Japan in the early 1890s, and he was aware of the richness of the Chinese flora. He had been keen to go to China but had been refused permission by his uncle Henry James Veitch (Howard 1980). Sir William Thiselton-Dyer, then director of Kew, had been getting enthusiastic letters from Henry; he was undoubtedly an ally in emphasizing the advantages of an expedition to China (Nelson 1983). Another ally was C. S. Sargent of the Arnold Arboretum (Wilson 1913). In 1899 Thiselton-Dyer was asked by Veitch's to recommend a young man capable of undertaking a prolonged collecting journey in China. Thiselton-Dyer proposed E. H. Wilson (see Howard 1980).

The object of Wilson's first trip for Veitch's was to obtain seeds, bulbs, and liv-

Mature kiwifruit are harvested in New Zealand during May (early autumn). (Photo courtesy of the New Zealand Kiwifruit Authority.)

ing plants of species almost certain to be hardy in Great Britain, species at that time known only by dried herbarium specimens. Plant collecting was often extraordinarily competitive, and claims to priority were considered very important. In a newspaper interview at the time ("The Flora and Fauna of Ichang," 1902), Wilson therefore said only that his "object has not been to collect any particular species of plants, but anything likely to be of interest or value to the botanical world." Later he admitted that he in fact had instructions to collect a very particular species of plant, *Davidia involucreta*.

Wilson's first task was to visit Henry, who was then at Simao (Szemao), Yunnan, to obtain details about *Davidia* and information on the flora of western China in general (Wilson 1938). The journey to Simao to see Henry certainly was not an easy one: "I crossed no less than eleven distinct ranges, the highest altitude being 8200 ft., and many exceeded 7000 ft. and were fearfully steep. In one place we ascended 1000 ft. in three-quarters of an hour. The easiest way to climb such a mountain is to hang on to the mule's tail and let him drag you up" (Wilson 1900). Simao was "the most God-forsaken place imaginable" but the trip was worth it: "I found Dr. Henry a splendid fellow, full of knowledge of all kinds. A more genial man I have never met. He assisted me in every way he could, and whatever success attends our venture will be largely due to him" (Wilson 1900). Henry "freely imparted important information regarding the plants Wilson was in search of, and the ways and means of reaching them" (Veitch 1906). Wilson profited by this advice and used much of Henry's field experience in making his early plant introductions. As B. D. Morley (1979)



E. H. Wilson with two Japanese friends, T. Miyoshi and H. Ushio. The photo was taken in Kagoshima, when Wilson visited Japan in 1917.

has pointed out, many of the plants first introduced by Wilson were those discovered by Henry during his period at Yichang. Although Henry did not discover the kiwifruit, it was he who sent the first fruits to Europe and recommended that the plant be cultivated.

After leaving Henry, Wilson traveled to Shanghai and then up the Yangtze River to Yichang, where he established himself for the next two years (Wilson 1905). Yichang was by now a busy port. (The Yangtze Gorges made Yichang the upper limit for steamers on the river.) The Chinese population was about 35,000, and the European population had increased from the dozen of

Henry's early days in China to about 45. There was the staff of the Maritime Customs, the English consulate, the German consulate, and about 20 missionaries. The China Inland Mission, the Scottish Mission, the American Presbyterian Mission, the American Episcopalian Mission, the Scandinavian Mission, the Canadian Mission, and the Roman Catholic Mission were all resident or frequent passers through. Yichang was the starting point for travels into western China. Wilson made it his base for collecting trips into the mountains and for overwintering.

In 1900 Wilson obtained seed of 671 different species of plants, herbarium specimens of 1764 species, and a great quantity of bulbs and roots of herbaceous plants. His collections during the following year were also impressive: seed of 305 species, herbarium specimens of 906 species, and 35 cases of bulbs, living roots, and rhizomes of herbaceous plants, all shipped to Britain (Veitch 1906). As the parcels of seed arrived from China, they were sorted and sent to the various Veitch nurseries. Here nothing was stinted in the attempt to get satisfactory germination (Harrow 1931). Often, of course, the seed of a species would fail to germinate, but many efforts were successful. In 1904 the kiwifruit appeared in the Veitch catalogue. "It has recently been raised from seed gathered in the province of Hupeh, Central China, sent by Wilson, and has proved hardy and of very rapid growth, at our Coombe Wood Nursery . . . [It produces] edible fruits the size of walnuts, and the flavour of ripe gooseberries. Apart from its flowering and fruiting qualities it is a remarkably handsome plant, and will be of great value as a pillar or pergola plant in the



Kiwifruit being inspected and graded in New Zealand. (Photo courtesy of the New Zealand Kiwifruit Authority.)

open garden" (James Veitch & Sons Ltd. 1904).

Like many of the other plants brought in from China, the kiwifruit initially aroused great interest. It received an Award of Merit from the Royal Horticultural Society in 1908. The first flowering of plants in England and France was noted at length in the horticultural journals of 1909. But Wilson was not satisfied with the plant's performance in England: writing to C. S. Sargent he complained, "A. chinensis, introduced by Messrs. Veitch, has so far failed to do itself full justice; but, in the years to come, I believe it will be one of the finest ornamental climbers in cultivation . . . A difficulty to

the classifier and a drawback from the cultivator's point of view is the fact of the flowers being polygamous [dioecious]" (Wilson 1909).

That the flowers are dioecious (bearing staminate [male] and pistillate [female] flowers on different plants) was definitely a drawback, for all the plants introduced and sold by the Veitch nursery were staminate. Without pistillate plants, horticulturists could not produce the new and rare fruit Henry and Wilson had hoped for. It was not until 1912, eight years after the first plants were distributed, that the nursery was able to advertise that among the new plants recently introduced from western China through E. H. Wilson was "*Actinidia chinensis foemina*. The female form . . . in habit of growth . . . is similar to the now well-known male form" (James Veitch & Sons 1912). It seems, however, that by then horticulturists in Europe had lost interest in the kiwifruit. The long-awaited first production of fruit in England in 1911 appears to have gone almost unremarked. The dissolution of the Veitch firm, and then the Great War, came soon after. The kiwifruit in Britain has remained only an ornamental curiosity; certainly the plants brought in by Wilson and sold by the Veitchs did not give rise to any new horticultural industry.

Making matters worse, it is now apparent that Wilson could not even claim credit for introducing the first kiwifruit to Europe, just as he could not claim credit for the first *Davidia*. In 1897 Maurice de Vilmorin had secured seed of *Davidia* from Père Paul Guillaume Farges, a member of the Missions Étrangères, stationed in northeast Sichuan. The following year, and two or three years before Wilson's collections reached England,

one *Davidia* plant was successfully raised at the arboretum at Les Barres, in France. A rooted cutting of this plant was sent to Kew in 1901 while Wilson was still in China. At that time plant introduction was very competitive, and for Wilson this was "yet one little cup of bitterness to drain" (Wilson 1938). Again, Farges had sent seed, in the case of *Actinidia chinensis*, to Vilmorin in 1898, and a plant had been raised in 1899 (Vilmorin and Bois 1904), several years before Wilson's own seed had arrived in Europe. No matter that Wilson was responsible for the introduction of every seedling plant but one of the kiwifruit: he could not claim the first plant.

The Kiwifruit in the United States

At the beginning of this century, the main organization introducing new plants into the United States was the Office of Foreign Seed and Plant Introduction in the Bureau of Plant Industry, U.S. Department of Agriculture. The earliest recorded introductions of kiwifruit into the United States occurred in 1900 (USDA Bureau of Plant Industry 1905). The seed of the *yang tao* (the name used in the Yangtze Valley) first came from G. D. Brill, who had made an extended trip through China and visited Yichang. Some of the other seed he sent is listed as being "presented by Mr. E. H. Wilson of Kew Gardens, through Mr. G. D. Brill." This seed failed to grow, however (Fairchild 1913). The next imports from China were more successful. In the autumn of 1903, the American consul-general at Hankou (Hankow), L. S. Wilcox, received a sample of kiwifruit sent downriver by a Mr. Goodhart of Yichang.

"When the fruits are picked and left for a few days until soft they are very fine eating," Wilcox said. "They have the flavour of the gooseberry, fig, and citron. They make delicious jam, pies, and sauce." Wilcox was so impressed that he decided to get a few plants to send to the U.S. Department of Agriculture.

A letter was sent to Mr. Goodhart in Yichang who agreed to help. For a long time nothing happened. Finally, Wilcox wrote, "a box came [on March 19, 1904] weighing

three or four hundred pounds, with the information that they had been secured at Chungking (1000 miles up river) from plants formerly obtained on the borders of Yunnan by Mr. Wilson, under whose advice they have been packed in moss and sand, warranted to keep for months. I felt I had a white elephant in my hands; the bill for them has not yet been presented" (L. S. Wilcox, quoted by Fairchild 1913). Four vines survived the long journey from Hankou to Shanghai, Nagasaki, San Francisco, and, finally, the Plant Introduction garden at Chico, California. The vines grew well and flowered for the first time in 1907 (Fischer 1909). Over the next few years more than 1300 young plants propagated from the four vines were widely

Harvested kiwifruit are removed from the orchard in large bins. (Photo courtesy of the New Zealand Kiwifruit Authority.)



distributed throughout the Pacific and Gulf States (Fairchild 1913). Unfortunately, all of these plants also proved to be staminate and were therefore valuable only as ornamentals. The potential value of the kiwifruit as a fruiting plant could not be assessed.

Why all the plants initially introduced to the United States and England proved to be staminate is unknown. Early botanists noted that staminate kiwifruit plants are considerably more common in the wild than pistillate plants. Herbarium material of many *Actinidia* species is also mostly staminate: this may result from a predominance of staminate plants in the wild, or simply from the greater floriferousness and therefore more frequent collection of staminate plants. No experimental evidence exists for sex ratios either in the wild or from seed.

Finally, in 1913, the bureau purchased plants from Veitch's that had been grown from cuttings of the female plant (sent by Wilson) that had produced fruit in England in 1911. Although some plants from seed sent earlier by Wilson later proved to be female, these plants from Veitch's were "the first known female plants of this promising fruit-producing species to be introduced into the United States" (USDA Bureau of Plant Industry 1915a). Two years later a photograph was published of a kiwifruit vine "bearing a single . . . fruit, the first to be produced in America. The vine [of unstated origin] was trained over the porch of a private house at Chico, California, and produced a number of fruits" but unfortunately "never reached maturity" (USDA Bureau of Plant Industry 1915b).

Thus Wilson was clearly responsible, directly or indirectly, for the introduction of the kiwifruit into the United States. Wilson

believed the kiwifruit had considerable potential as a fruiting plant, as did David Fairchild, the agricultural explorer in charge of the Office of Plant Introduction. Fruit produced from vines growing in California was shipped to Washington and "eaten by a number of people of discriminating taste, and the universal opinion appears to be that we have in this Chinese fruit a distinct new possibility for home gardens in Southern regions. What American horticulturists will do with it remains to be seen" (USDA Bureau of Plant Industry 1918). As we now know, American horticulturists did very little. Just as it had in England, the kiwifruit remained no more than an ornamental curiosity in the United States. So little interest was taken in it that Wilson didn't even include it in a manuscript he was completing at the time of his death in 1930, "Wilson's Plants in Cultivation." The manuscript has accounts of three different *Actinidia* species but not the kiwifruit, *Actinidia chinensis*, even though the kiwifruit is now considered perhaps the most important of all the commercial plants Wilson brought into cultivation.

The Arrival of the Kiwifruit in New Zealand

The introduction of the kiwifruit to Britain and the United States is surprisingly well documented, but it has little commercial significance. These introductions did not lead to the horticultural industry of today. Ironically, very little has been written on how the kiwifruit was introduced into New Zealand, even though all commercial kiwifruit orchards throughout the world are

based on scions or seeds that originated in New Zealand.

The first known kiwifruit plants in New Zealand were grown near Wanganui, a town on the west coast of the North Island. Alexander Allison was a sheep-farmer there whose greatest interest was the growing of all sorts of plants and trees and, most particularly, new and novel fruiting plants (Allison 1930). One of the plants he succeeded in getting to grow and produce fruit was the kiwifruit. An acquaintance of Allison, named Frank Mason, wrote: "I have a record in my diary dated July 10th 1910 that I had tasted the fruit of this plant from a bush grown in his garden" (Mason 1953). Although it is uncertain as to whether these were the first kiwifruit plants in New Zealand, it is clear that they were very important: all the cultivars of kiwifruit, and all the kiwifruit plantings in New Zealand, can be traced to Allison's plants in Wanganui.

The most plausible story as to how Alexander Allison obtained his first seeds or plants takes us back to Wilson and Yichang. Most of the Europeans in Yichang lived outside the Chinese city in a suburb stretched along the bank of the Yangtze. Here were the buildings of the Imperial Maritime Customs, the consulates, and the various missions. A British gunboat often lay opposite at anchor in the stream. Life for the European population had its difficulties, as that remarkable traveler Mrs. Bishop (Isabella Bird) observed: "Their amusements consist chiefly in tennis, shooting, and boating picnics to some of the picturesque ravines and rock temples off the main river, and to the Ichang Gorge. The British Consul . . . and the Commissioner of Customs . . . do their best to alleviate what, it must be confessed,

is the great monotony of life in a small and isolated community . . . amusements are apt to pall. The winter evenings are long and dull, and those of summer hot and mosquito-infested. People soon gauge the mental and social possibilities of newcomers, and know exactly what their neighbours think on every subject which can arise, . . . and the arrival of a stranger and of the mail boat and the changes in the customs staff are the chief varieties in life" (Bishop 1899).

Wilson was one such stranger; his frequent comings and goings would inevitably have been one of the "chief varieties in life." He would undoubtedly have been known personally to every European resident of Yichang. He has written that "in 1900 I had the pleasure of introducing this fruit to the foreign residents of Ichang, with whom it found immediate favour, and is now known throughout the Yangtze Valley as the Ichang gooseberry" (Wilson 1929).

The Church of Scotland opened its mission at Yichang in 1878. In 1897 the work of the mission was augmented by the arrival of three young female missionaries from New Zealand under the sponsorship of the Church of Scotland Women's Association for Foreign Missions (Hewat 1960). One of these missionaries was C. G. (Katie) Fraser, a teacher and evangelist, who was to remain at Yichang until the Revolution of 1911. Miss Fraser had sisters in New Zealand, one of whom, M. I. (Isabel) Fraser, was also a teacher and principal of Wanganui Girls' College. In 1903 Isabel Fraser was granted a leave of absence for eight months and she left Wanganui to join her sister in China. When she returned to New Zealand in February 1904, she brought with her some seeds

of the kiwifruit. A. M. Atkins, a niece of Alexander Allison, recalled: "Many years ago, when I was at Wanganui Girls' College, the head mistress, Miss M. I. Fraser, went for a holiday to China and brought back some seeds of Chinese Gooseberry [kiwifruit]. These she gave to [Mrs. Atkins' father] Mr. Thomas Allison, who passed them on to his brother, Mr. Alexander Allison; he grew them . . ." (Atkins 1948).

Today, nearly 80 years later, it is not possible for us to confirm that the seed brought from China by Isabel Fraser and given to Alexander Allison did actually grow and produce the plants that were fruiting in 1910. Allison's plants may have come from elsewhere. It has been suggested that other introductions of kiwifruit to Wanganui took place at about the same time. Nevertheless, it seems plausible that the kiwifruit of today had its origin in those seeds from Yichang and that Katie Fraser was made aware of the kiwifruit by Wilson: Wilson is therefore due much of the credit — even if indirectly — for bringing the kiwifruit to New Zealand.

It seems ironic that the sending of seed by a missionary to an amateur gardener should eventually lead to a new horticultural industry, when the efforts of the Veitch Nursery and the U.S. Department of Agriculture were so much less successful. After all, Veitch's was the greatest nursery of its day, and the U.S. Department of Agriculture had all the resources of the Office of Foreign Seed and Plant Introduction, with its plant explorers and its chain of plant introduction gardens. Perhaps it is largely luck that determines whether the introduction of a new plant is successful.

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