A general view of the Karaca Arboretum.

The Karaca Arboretum

DAVID TONGE writes about the arboretum created by Hayrettin Karaca 30 years ago at Samanli Koyu, Yalova in Turkey.

A garden begins to show itself in five to ten years. But an arboretum needs a generation or two. So when in 1984 at the age of 62, Hayrettin Karaca decided to create an arboretum – and to build it mainly from seed on land analyzed as unsuitable – he was rolling the dice. But not for the first or the last time.

In the 1960s and 1970s, Karaca had focused on building up the family knitwear operation into the first Turkish company to export to all five continents. In the early 1980s, he passed over management to his son, Atay, and diverted his attention to the passion for nature for which he has become a household name in Turkey and a medal winner abroad. (see *IDS Yearbook 2012*, pp. 175-176)

In 1981, he was the driving force in the launching of the country's first arboretum, the Ataturk Arboretum north of Istanbul, owned by the General Director of Forestry and managed by Istanbul University. Throughout that decade, he fought to save the few remaining grand forest trees in the country and to ensure that plantings were of species natural to each environment and not just *Pinus*, then the universal panacea of the Forestry Department. In 1992, he pushed through the creation of TEMA, an organization committed to fighting erosion. Since then, he has helped build this up to its impressive half a million members, driven legal reforms to protect pastures and improve the treatment of forest land, talked at schools and universities throughout

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Juniperus communis 'Hibernica' and *Chamaecyparis lawsoniana* 'Alumigold' together with other conifers raised from seed such as *Picea pungens*.

the country, and ensured the planting of the first one billion of TEMA's target of ten billion oak trees for Turkey.

All this time, he has been distributing plants to public gardens and universities, including 1,800 to the Ataturk Arboretum, 462 plants to a–soon to fail–arboretum in Fethiye, 1,500 or more to the Nezahat Gökyiğit Botanic Garden in Istanbul, and 622, by his count, to an arboretum being established at the Military Academy in Ankara. "The soldiers look after plants well. I will give more. If necessary, they put a sentry at each plant to make sure it lives." All in all, Karaca reckons that he has distributed over 200,000 plants to enrich the gardens and towns of country, while, of course, keeping those required for his own arboretum.

Members of the IDS who travelled with him in the 1980s and 1990s will remember his passion for collecting seeds. This dated back to when he was still in his 20s and his textile operations–the first in the country to give workers in Turkey annual leave–had a greenhouse to help house his early collections. Year in, year out, he would bring back suitcase after suitcase of seeds collected in the wild in Turkey and abroad and from arboreta around the world. He remembers one trip in the 1980s when in 42 days he visited 62 arboreta. A look at his seed books shows that in 1986 he planted 1,097 types of seeds, in 1987 2,043, in 1988 1,040, in 1989 1,456… These were from "*Kalm*" (Kalmthout), "*Trp*" (Trompenburg), other arboreta, IDS tours around the world, and, of course, Turkey.

By 2005, the date of his last census, Karaca had 7,000 varieties of plants and cultivars in the arboretum and the number has risen since. Around 1,000 of the plants are endemic to Turkey, and Karaca is aiming to build this number: "Too many plants are under threat. I want there to be samples here so they can

Hayrettin Karaca was profiled in the IDS Yearbook 2012 in connection with his Right Livelihood Award, commonly known as the Alternative Nobel Prize, "for a lifetime of tireless advocacy and support for the protection and stewardship of our natural world, combining successful entrepreneurship with effective environmental activism".

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Harriet Tupper with Hayrettin Karaca holding *Quercus polymorpha* that had been presented by Council of the IDS.

live." In all, 10,000 species had been identified in Turkey as of the end of 2012, with one new species being identified every ten days or so since the 1990s.

A combination of nearly four decades, the soil, and the balmy climate (average annual rainfall of 750 mm per square metre spread through the year and monthly average temperature of 6.6-23.5 °C) in Turkey's fruit garden between the slopes of Bursa's Mount Olympos and the Sea of Marmara – all these mean that there are some fine specimen trees. Some are familiar such as *Metasequoia glyptostroboides, Pinus engelmannii* and *Sequoia sempervirens*, others less so including *Carpinus betulus* 'Columnaris', *Corylus jacquemontii, Fortunearia sinensis, Gymnocladus dioica, Maackia amurensis, Parrotia persica, Taiwania cryptomerioides* and, my favourite, a dramatic *Cryptomeria japonica* 'Globosa Nana'.

Particular strengths are the acers, of which the arboretum has 150 different varieties and hybrids; Prunus (65 varieties); *Chamaecyparis* (122 varieties and hybrids); *Quercus* (153 varieties, including the 16 endemic to Turkey) and *Pinus* (146 varieties): in all cases, these are the largest such collections in Turkey. In certain areas, such as the far south west of the arboretum, these are in groves. But, in general, each family is scattered widely through the 13.5 ha (30 acres) of the arboretum, with the planting creating a painter's tapestry rather than a taxonomist's dream. The trees and shrubs are complemented by a range of lilies, dahlias, cosmos, hostas, agapanthus and other flowers. And the flat lie of what was formerly an apple orchard is now broken up by rocks inspired, Karaca says, by the Royal Botanic Garden Edinburgh. It is a delight to the eye. Nature at its most generous.

The beauty is in the detail. In parallel with his years of scouring the world – and a few gardens such as Kew – Karaca was travelling 340,000 km through his own country. The eye he had developed since childhood meant

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In the foreground one of the *Pinus brutia* mutants, grown from material identified by Hayrettin Karaca during his travels through Turkey and unique to the arboretum. Behind rises a columnar *Juniperus drupacea*, native to Turkey and the eastern Mediterranean.

that he was quick to spot the unusual and, over the years, he has collected an extraordinary range of pygmy conifers. Looking at the low bushes on the rocks grouped south of his house, it is hard to believe that one is a mature *Pinus sylvestris* and another *Picea pungens* Glauca. They are 30 years old, and only 1 m tall. Further from the house is a group of various examples, all pygmies, of *Pinus halepensis, P. brutia, P. strobus, Cedrus libani* and *Juniperus chinensis*.

Such mutants are critical to science as mutations play a part in normal and abnormal biological processes, including evolution, cancer, and the development of the immune system. Mutants are rare in the wild, and even rarer in collection, but Karaca has built up a unique collection of 600 or so. He loves recounting how each was found, mostly on the rocks far from the mountain trails in Turkey. And he loves scrutinizing their young growth to see if they are reverting, as the odd fresh growth on some of them has, to the unmutated form.

He organized his trips in Turkey with his characteristic energy, taking with him companions like Professor Dr Tuna Ekim (one of Turkey's great taxonomists), Dr Mehmet Koyuncu (Department of Pharmaceutical Botany, Ankara University), Nihat Gökyiğit (later to found the Nezahat Gökyiğit Botanic Garden) and Professor Dr Adil Guner (who now directs this last garden). In these Dinosaur Trips, as they called them, they located a wide range of plants and monumental trees, describing these in the fine quarterly magazine which the Karaca Arboretum published from 2001 to 2007 and in

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The deciduous conifer *Metasequioa glyptostroboides*, which has benefited from the high water table under the arboretum.

books such as *The Monumental Trees of Turkey*.

All this fed the Arboretum with seeds and cuttings, as did the way it began to co-host (with a Ministry of Agriculture facility at Menemen) the national seed collection scheme of TUBITAK, the state scientific council. These soon began to be complemented by the wide range of garden-origin species which the Arboretum has developed over the years. Other assets include some 50,000 slides and a huge botanic library gathered over the world.

Karaca's ownership of the land dates back to a debt incurred in the 1940s by one of the customers of the knitwear factory of his father, Karacabeyli Hocazade Halil. The customer could not pay so handed over title to what were then some remote and untended marshes south of the beach town of Yalova. At the time, there was only one hotel on the coast and a thermal bath close by, which claims it was beloved by Kemal Ataturk, founder of the modern Turkish Republic.

Karaca eventually took over management of the factory and of the land. His father had drained this and Karaca's initial efforts were in developing an orchard for apples and pears. He introduced to Turkey apples such 'Stark Brothers' 'Golden Delicious' and 'Red Delicious', growing up to 46 cultivars, as well as 52 cultivars of pears. In a good year, he would produce 1,400 tonnes of apples, sending them off to the markets in Istanbul. He visited apple tree producers through the world, noting how they were able to keep apples on the branch through to March.

Before long, he found his workers had begun to strike off on their own and compete, so he set up the first cold store in the area. In the end, he found he could not make money. In 1974, he divided the land, now built up to 460,000 square metres with his brothers, Nurettin and Fahrettin, built a house – in which not one metal nail was used – in 1976, started a garden, and then in 1984 took his decision to develop an arboretum. He started with 68,000 square metres, subsequently building it up to its present size.

What about the sustainability of the arboretum? Karaca himself took over the family textile business in the 1940s and, for the long years that business flourished, financed the arboretum from its profits. When I first visited it in the early 1990s, the focus was on building up collections – in particular of *Acer* and *Quercus* – and there was a limited business in retailing plants which had mainly been grown from seed which he had collected. In this, it was differentiated from the various nurseries in the Yalova area which imported Dutch and Italian plants for the private and municipal trade. Ten years later, the arboretum's retail business began to take off, now earning the arboretum more than the revenues from the 5,000 visitors who come each year.

He himself is a dynamo. When I visited him in July 2013, we watched together a pre-recorded television broadcast in which he was hosting a scientist talking of recent research on Turkish villages. In August, he was running a campaign against supermarkets, and in September appearing in a case he had launched against a gold mining operation which threatened the forests in the Kazdag mountains south of the Marmara Sea. But he was born in 1922 which means an increasing role for the family-owned Karaca Arboretum Foundation for whom keeping alive his legacy is an inspiring but challenging task.

Also to note in Istanbul

Ataturk Arboretum in Bahcekoy, Istanbul
This 296-hectare arboretum on the edges of the Belgrade Forest north of Istanbul was launched by the Forestry Faculty of Istanbul University in 1981. It is an expansion of the first nursery founded in Turkey, in 1916, and some of the trees planted in that nursery remain. It is now part of the General Directorate of Forests. Well laid out around the Ottoman-era lakes of Kirazlibent, it has a good collection of Turkey's endemic trees as well as *Quercus* and other species from around the world.

Nezahat Gökyiğit Botanic Garden in Atasehir, Istanbul
46 hectares which sets out "to create a beautiful educational garden, a green lung for the city", increase public awareness of the importance and value of plants and promote scientific research. Directed by Dr Adil Güner, it has an area dedicated to xerophytic and halophytic plants that are drought tolerant and resistant to global warming, aiming to contribute towards the worldwide struggle against soil erosion and desertification.