

## URBAN ALLEY TREES IN BUDAPEST

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Integration and landscaping of Budapest started after the union of Buda, Óbuda and Pest in year 1873. In this time more than 50 % of planted trees were *Robinia pseudo-acacia*, following by *Acer platanoides* and *Aesculus hippocastanum* with number of 6000–7000, and species of *Fraxinus excelsior*, *Ailanthus glandulosa*, *Celtis orientalis*, *Ulmus effuse* and *Acer negundo* with number of 1000–2000. In World War I and II, lot of trees were cut. The remained parks needed the fast-growing species such as poplar (*Populus*), ash-leaved maple (*Acer negundo*) or silver maple (*Acer saccharinum*). The aims in this investigation were to monitoring the planting materials, supporting of alleys, healthy states of trees as summarizing survival rate under urban conditions. The effects of urban environments conspire to the old trees damage, the average age of trees in alley calculated about 29.1 year in Budapest. The life cycle of a tree is short. In present-day the alleys in Budapest contain 39 species with more than 100 cultivars. The ideal trees bear shade, drought, poor soil, continuously pruning of roots and shoots, the injuring, the air pollination, the salting and the dog urine. These strong requirements decreased the planting number of sycamores (*Platanus*) and horse-chestnuts (*Aesculus*). It is recommended to keep trees assessing, to maintain them and change the salting materials under wintertime. The heavy environmental conditions determine the applicable tree species in cities.

### Introduction

A committee for public parks in Budapest was established by Palatine (Governor prince) József supported by King Ferenc I. Its aim was to develop the green surfaces in city, to plant new alleys (Budapest Lexicon, 1973). The most of main public parks had got shape in this time (City Park, Margaret Island). The landscaping had started firstly on the Danube bank of Pest and Buda and city part of Pest (Radó, 1981). The injury of flooding in 1837 took in the banks of Danube and all of Margaret Island. After flooding this committee and Hungarian nobility were lavish in the fast regenerating of concerned area. In this time, landscaping of bigger area in downtown started. The Palatine József was died in 1847, and then the works of his committee decreased.

The great comeback was the era after the of Austro-Hungarian compromise in 1867 when Franz Josef was crowned to Hungarian King. City Gardening, what is working since this year, was established by Emil Fuchs. Integration and landscaping of Budapest started after the union of Buda, Óbuda and Pest in year 1873. The development of public transport improved the area of public parks – mainly in suburb. Landscaping of Buda also started in this time (most of alleys in Buda were setting). Landscaping bounding to Millennium Celebration was significant. More than 50 % of planted trees were *Robinia pseudo-acacia*, following by *Acer platanoides* and *Aesculus hippocastanum* with number of 6000–7000, and species

of *Fraxinus excelsior*, *Ailanthus glandulosa*, *Celtis orientalis*, *Ulmus effuse* and *Acer negundo* with number of 1000–2000 (Statistical Yearbook, 1898). The most of present-day public parks were evolved or shaped in this era.

In World War I, lot of trees in downtown were cut because of lack of coal to heating – for example from the 1883 established alley in Andrassy Avenue only one sycamore tree (*Platanus*) survived it because of armed guards. The developments of landscaping were improved by Károly Råde in late 1920s (Radó, 1985). In his era lots of streets and alleys were planted with trees. Reports of that time noted 502 alleys with detailed list of tree species (Råde, 1929). Károly Råde was followed by Dezső Morbitzer, who finished the landscaping of Gellért Hill, formed gardens of Tabán and Városmajor (Kiácz, 1968). Reports of late 1930s showed 212 tree-planted walks in Budapest with more than 160 000 planted trees. In that time the planted tree species were the same as the species at landscaping of Millennium Celebration (Statistical Yearbook, 1898), however from the middle of 1920s the following tree species were planted: *Acer campestre*, genus of *Sorbus*, *Fraxinus* and *Tilia*, which species are native in Hungary (Morbitzer, 1937).

In World War II, the trees were hard injured under siege of capitol city. The reconstruction of areas was carried out with building-rubble covered or mixed with soil in most times (Kiácz 1968). The reconstruction works of landscape were finished in late 1940s (Radó 1993).

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After reconstruction the structure of city was rebuilt hard, building of council blocks in the outskirts of city started. The maintenance of these areas was attended to capitol of Budapest from the middle of 1950s to the end of 1980s. Blocks of flats, shops and covered surfaces took the places from old houses with garden and public parks. The remained parks needed the fast-growing species such as poplar (*Populus*), ash-leaved maple (*Acer negundo*) or silver maple (*Acer saccharinum*). Professional replanting of overage trees started from the middle of 1960s. Besides the most planted trees in 1930s (Morbitzer, 1937), silver linden (*Tilia*

*tomentosa*) and mountain ash (genus *Sorbus*) were planted (Schmidt, 2006).

Nowadays the growing number of inhabitants in Budapest, the technological improvements and more and more cars increase the environmental pollutions in cities. However from 1980s the financial funds of landscaping was decreasing, the tendency in present-day is again increasing. The financial fund of city landscaping is near by two thousands millions, however this amount is only 1% of total cost of Budapest in 2013 (financial regulation in 2013).

The aims in this investigation were to monitoring the planting

materials, supporting of alleys, health status of trees as summarizing survival rate under urban conditions.

### Material and methods

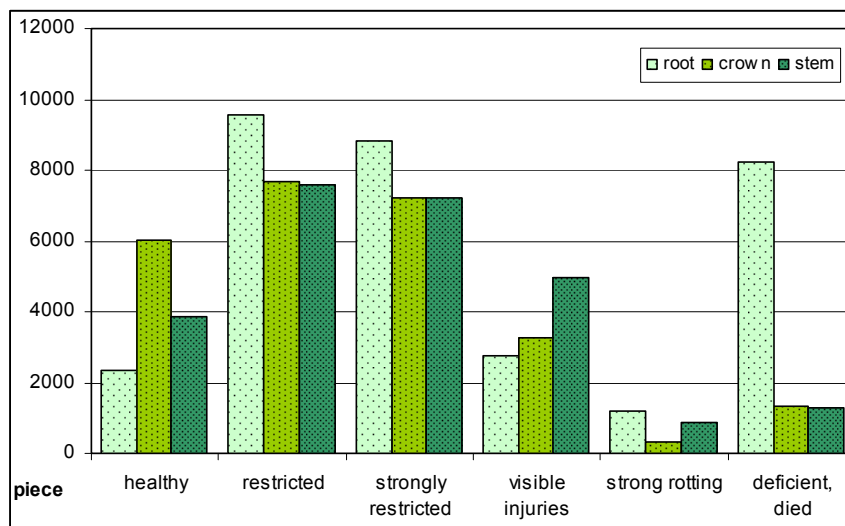
Data were collected by Vilmos Szaller (FŐKERT Nonprofit Zrt., Nonprofit Gardening Company of Budapest) and evaluated in cooperation with Department of Floriculture and Dendrology of Corvinus University of Budapest. All of trees in Budapest, about 12 000 trees, were subject of evaluation. Assessments were based on EU-methods (Radó, 1999).

There are five monitoring aspects, what are noted by letters (A, B, C, D, E). The semantic contents are the follows: A: roots, growing space, B: state of trunk, C: state of crown, D: the degree of maintenance, E: investigation of vitality. Each aspect has got five rating grade from one to five. Number one means unhealthy or died part of trees, number five means healthy part of trees with good condition.

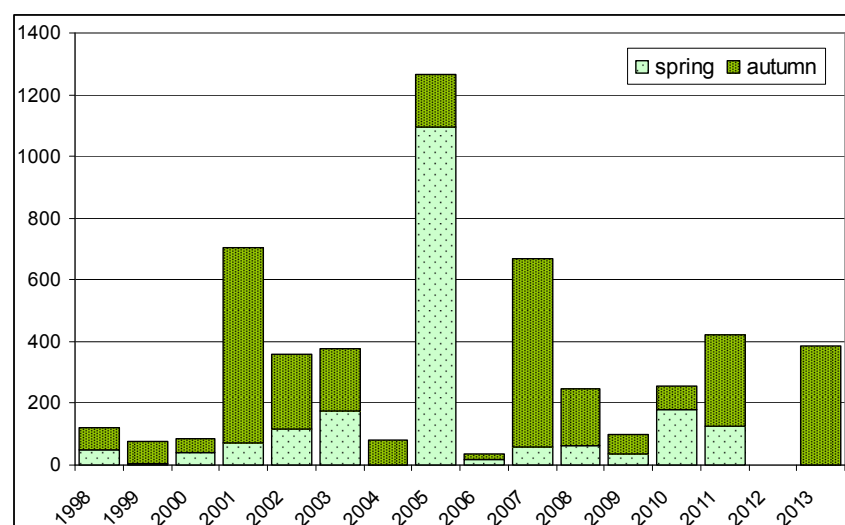
### Results and discussion

#### Tree planting

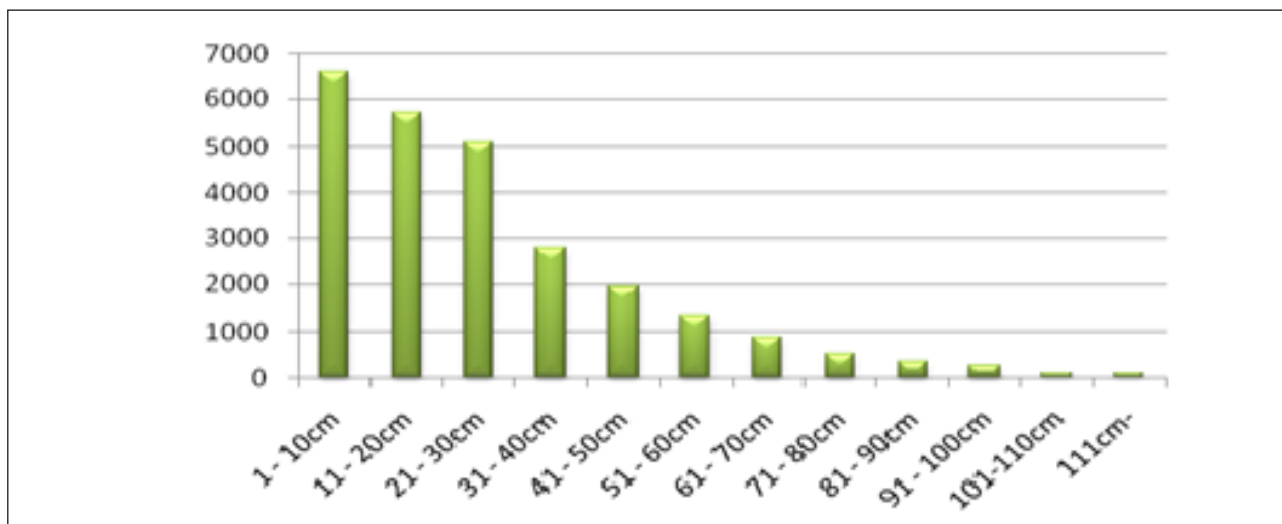
In 1920s there were more requirements of tree planting considering the direction and the width of streets, the size of buildings, the influence of covered areas, the pipes and cables of public services in the air and in the ground and the planting with trees of the bounded lines in public transport such as trams and suburban railways. Ninety years ago, the fire prevention and view of bee-keeping also belonged to requirements of tree planting (Cséser, 1928). The difficulties of tree planting in city are much the same. The 70% of alley trees in Budapest do not meet the requirements of Cséser (1928). In the last century the original ground remained under the trees, however nowadays there is not any healthy, unbroken ground to planting. This is the reason why the soil change is necessary before planting. The changing of



**Figure 1** The health status of root, crown and stem of trees managing by FŐKERT (Capital Gardening) (Budapest, 2009)



**Figure 2** Tree plantings from 1998 to 2008



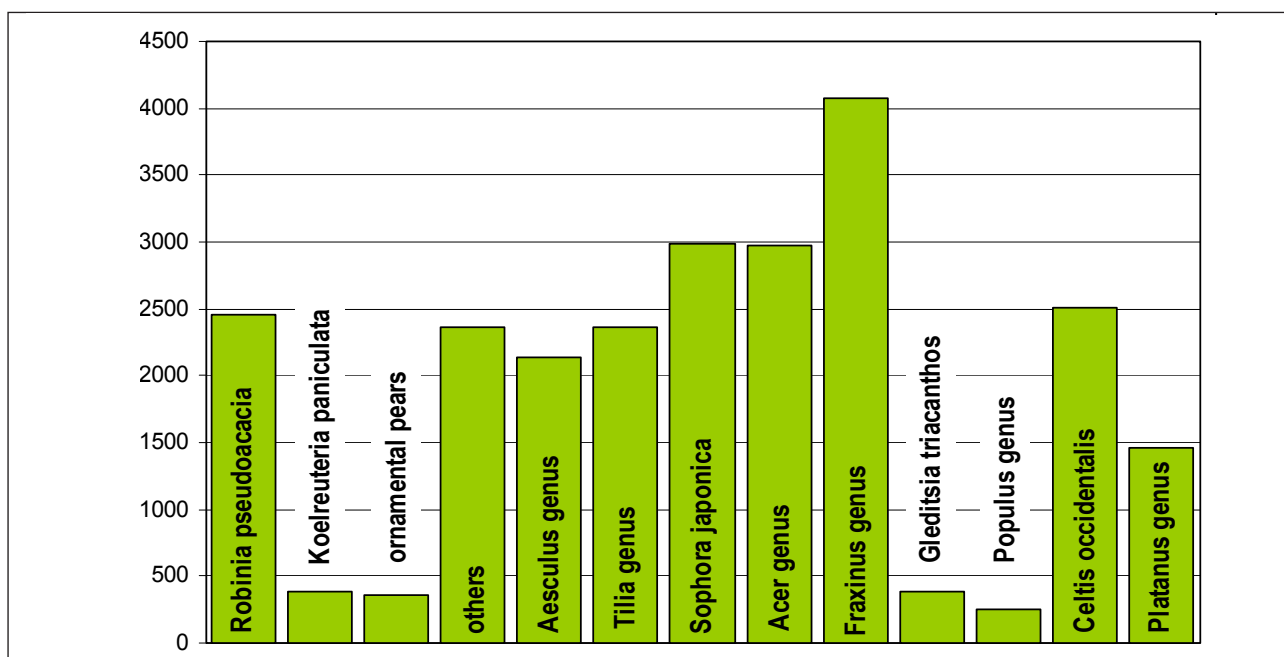
**Figure 3** Distribution of trunk diameter of alley trees (Budapest, 2009)

transport, the spreading of great transportations and cables of the mass media are decreasing the possible fields of planting. These effects conspire to the old trees damage, the average age of trees in alley calculated about 29.1 year in Budapest (Developmental Concept of Landscaping, 2009). It could mean just as well that the renewal timing of alley trees is optimal; the injured trees are changed continuously. Unfortunately, it is not right. The health status of the most of the young trees runs down so fast, that they do not reach the older age (Figure 1). This run-down of trees is caused by the endurance of environmental pollution. The trunk diameter categories of these trees show the same picture (Figure 3). The high rate of young trees means that the life cycle

of a tree is short. The number of tree planting is varying yearly (Figure 2). It is typical that we can see larger tree plantings in a 4-years-period.

#### Species of trees

Csérer (1913) noted 14 species later (1928) 23 species in details from alleys in Budapest. Råde (1928) mentioned 15 species. Csérer (1928) recommended to planting more tree species in city because the trees have got different environmental requirements. In present-day the alleys in Budapest contain 39 species with more than 100 cultivars. The 80 % of all the trees in Budapest are common species (Figure 4). The ideal alley trees need to suit more and more requirements. The ideal trees bear shade, drought



**Figure 4** Composition of species among trees managed by FŐKERT (Capital Gardening) (Budapest, 2009)

all of the grounds (poor soil too), continuously pruning of roots and shoots, the injuring, the air pollination, the salting and the dog urine. Their wounds are healing fast and well and they are not susceptible to rot. They do not cause allergy and do not litter with their flowers, leaves and fruits. These strong requirements decreased the planting number of sycamores (*Platanus*) and horse-chestnuts (*Aesculus*) (Statistical Yearbook 1898 compared to Report of Capital Gardening, 2010).

### Managing of alleys

It involves pruning, irradiance, nutrient supply, tilling and protection. The pruning has got more reasons (make visible traffic sign or camera, cleaning way for cars and buses, for open wire line, injuring under buildings or alleviating of injury). The optimal irrigation under vegetation time is essential (Schmidt, 2006; Szaller, 2010).

Not only the space of crown, but the space of root is also limited in cities. It is caused by different pipes and tubes of public services and their repairing with turning of ground. The injuries by human are also a huge problem in public places (Figure 1). It is recommended to keep trees assessing, to maintain them and change the salting materials under wintertime.

### Conclusions

- The heavy environmental conditions determine the applicable tree species in cities.
- Although professional attendance, the healthy state of urban trees is run-down.
- The planting time strongly depends on election periods and politics.

### Acknowledgements

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