

AREA Forum

WHAT PROBLEMS DO TREES FACE IN YOUR CITY? HOW CAN THESE PROBLEMS BE SOLVED?

In this issue, we continue our discussion of the topic introduced in September, with contributions from Italy, Germany, and Brazil. The next subject will be methods for evaluating soil compaction. If you would like to participate in the next forum or would like to send a comment related to any previous ones, please contact me ach@hp9000a1.uam.mx.

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I have been working professionally on urban trees for more than 20 years. Although I still see many problems, when I consider how much more prevalent the problems were 10 years ago, I feel optimistic. In fact, the majority of people have come to understand the importance of trees in improving the quality of urban life. Most people now recognize the environmental value of trees.

In my opinion, the main problems faced by my profession in Italy (in order of importance) are as follows:

1. A general lack of knowledge about tree biology. Too many people believe that a tree is an unreactive and shapeless organism, able to tolerate everything. Unfortunately, this wrong idea has deep roots not only in the general population but also in many technicians and scientists. There is nothing worse than the arrogance of people who do not feel it necessary to improve their level of knowledge.
2. A low opinion of our profession. Many citizens believe that arboriculture is an easy job with no requirement for education and training. In Italy, we often hear the statement that if you don't know what to do, you can open a tree care or gardening company or a cleaning company.

3. A low level of scientific research. Only in the past few years have some universities, such as Padova, Torino, and Pisa, put energy and resources in the field of ornamental arboriculture.

The above situations lead to further problems for the profession and the trees:

- Low quality of trees. Most of the young trees planted are of low quality and cannot survive for a long time.
- Mistakes in planting. Too many people continue to plant the wrong tree in the wrong place.
- Mistakes in post-planting maintenance. Lack of information, the perceived low level of our profession, and the ignorance of the general population result in many trees being injured by improper pruning and lack of or improper post-planting care
- Mistakes in diagnosing disease. Often we overestimate a disease; at other times, we are not able to recognize the real cause(s) of tree problems.

I think that the key for changing something is education; in this way ISA could play an important role. It's important that our Society does not lose sight of its main mission: to educate people.

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At the Munich Technical University, we had been involved with urban vegetation research for more than 25 years, when research was initiated on the requirements for healthy plant life, specifically trees and shrubs, in the built environment.

For this discussion, we focus on the problems faced by the urban forest in Munich.

The city of Munich covers 311 km² (121 mi²), with a population approaching 1.3 million. The urban environment offers a large range of habitats for trees. Overall, trees and shrubs (i.e., the urban forest) cover 54 km² (21 mi²) of the city surface, comprising an estimated 600,000 trees in public open spaces and over 80,000 street trees. Thus, the city has a rich heritage of trees and shrubs.

The city is a complex pattern of different land uses, such as residential areas, commerce and industry, office buildings, transport infrastructure, and various types of open spaces (parks, sport grounds, true woodlands, farmland on the urban fringe). These all offer very different habitats and conditions for tree life. The projected tree crown cover is well below 5% in the inner city and commercial areas. An important part of the urban forest is found in low-density housing areas where trees and shrubs cover approximately 20% of the surface area. In the inner city and commercial areas, an increase of tree cover is especially needed to improve the environment, where conservation and regeneration of trees in open spaces and low-density housing areas are necessary.

One of the major concerns here is the felling of trees through infill developments. A nature conservation program with specific targets for urban forestry was developed to achieve these challenges. This program needs consequent implementation.

A citywide tree survey of the 19 most common tree species indicated that 20% of the trees showed signs of markedly reduced vitality. Stress factors for trees are the general urban environment (urban climates, limited space for growth both above and below ground) and, more specifically, the hard surfacing that limits water availability, along with soil compaction, both resulting in lack of oxygen supply

and exchange. Deicing salts are also a problem, and their use is probably unavoidable in winter. Frequent construction works are another major cause of tree damage in streets. Past activities are difficult to detect during field surveys because each tree is visited only at a particular moment, but casual observations suggest that construction work is a major problem for street tree life in the city.

The city has to accept the minimum requirements for healthy tree life and promote optimal services of the trees in ecological, aesthetic, and general amenity respects. On the other hand, trees must be selected that can tolerate the specific environmental conditions of the city (i.e., drought resistance), as well as aesthetic and even social dimensions relating to considerations such as crown architecture and amenity value.

The species most frequently planted in our cities (lime and maple, but also horsechestnut and plane-tree) show particularly severe symptoms of stress and decline. This can be explained by the fact that under natural conditions, these species have evolved and adapted to habitats that differ greatly from urban site conditions. Cultivars of these species are now commonly specified for urban tree planting, with selection often based on aesthetic criteria alone. However, such a basis for selection cannot overcome the genetic limitations that prevent trees from surviving in urban environmental conditions. Thus, broadening the range of tree species for urban areas is highly relevant for developing healthy urban forests.

To achieve this goal, empirically based knowledge on the full range of tree species that are well adapted to the urban environment is much needed. Tree survey data from a range of cities with similar climatic conditions could be used to prepare regionally based lists of species that have proved to be more adaptable to the urban situation over long periods. Trees in the cities of southeastern Europe could be of particular interest for central Europe because such trees have to withstand hot, dry summers and cold winters. Furthermore, there is an enormous wealth of tree species in the natural dendroflora of the Balkans and southwest Asia (e.g., Caucasus) that is still largely an untapped resource.

How could the International Society of Arboriculture contribute to face these challenges? We would like to focus on two points:

1. ISA can provide a forum for all who are interested in plant life in cities. Instead of creating a sectorial niche for specialists, this forum should enable open-minded exchanges of ideas between private and professional dendrologists, urban arboriculturalists, the nursery industry, planners, and decision makers.
2. By initiatives such as "Let's grow Balkan trees!", ISA could become the catalyst to develop partnerships between the highly developed nursery industries and countries that have a rich natural heritage to offer but which are much in need of help. This could lead to the buildup of specialist nurseries and production capacities in these countries, including the effective preservation of the dendrological resources in the wild.

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In Porto Alegre, the main problems of trees are

- trunk and branch necrosis
- weed infestation
- shallow roots, outside the soil
- incompatible species planted—excessive population of *Lagerstroemia indica* and *Ligustrum japonicum*.

The primary causes of these problems are

- lack of planning and integration among organizations offering services in the city
- low frequency of preventive maintenance of the plantings
- soil compaction
- insufficient area for tree development
- vandalism
- lack of understanding among the population about how could they participate in the process of tree planting and greening of the city.

Following are some proposals adopted by the Municipal Secretary of the Environment as a way to help solve some problems that trees face in public areas in Porto Alegre.

- Promote the planting of trees by directing studies and investigation requests to local universities.
- Plan for the planting of trees in different cities and regions, considering their inhabitants.
- Plan for the planting of trees in Porto Alegre, taking into consideration that it is a metropolitan zone.
- Promote the planting of trees, within the urban policy, as an element in the development of social functions of the city and to guarantee the welfare of inhabitants.
- Use the vegetation as part of an economic development strategy to make the city more attractive to tourists.
- Use the vegetation to revitalize urban spaces as public meeting places and sites for cultural events.
- Plant appropriate trees in the cities to obtain microclimatic benefits for citizens and structures.
- Establish annual plans to replace trees that have health problems.
- Develop tree planting projects to help control air pollution, intensifying plantings in streets with heavy flow of vehicles and in areas with greater accumulations of pollutants.
- Plant native species in the streets and avenues, but respect the original vegetation of the area in order to promote plant and animal biodiversity.
- Re-create nature using species that have been proved to thrive in an environment with similar characteristics.
- Promote the spread of native fruit-bearing trees through bird species that eat those fruits.
- Plant trees in avenues that are adjacent to green areas and that border mountains, using native fruit-bearing trees to attract fauna.
- When replacement street trees are required, strive to replant using the prevailing species of the street, if feasible and practical.
- Consider design aspects and not focus solely on traditional plantings.
- When undertaking tree planting projects, consider the following factors: climate, drainage and water supply, and nearby utility lines and boxes.

- Ensure that the permeable area for each tree is greater than 1.5 m² (16 ft²). In narrow streets, where it would be difficult to maintain a free area of 1.5 m², the pavement should be planned so as to allow water infiltration and aeration of the soil.
- Include irrigation with tree planting projects.
- Use polyhedral or porous coatings with paving materials, never a concrete base.
- Encourage people to use pedestrian walks and bicycle paths.
- Share the annual planning between the Electrical Distribution Company and the Municipal Secretary of the Environment (SMAM) to reduce the amount of pruning and to make trees more compatible with utility lines
- Create a technical advice council with representatives from all the organizations offering urban services, whose activities are related direct or indirectly to trees in public streets and areas.