Ecological maintenance in public and touristic parks
Gerhard Weber
Head of Department for Municipal Parks and Gardens
Municipality of Baden
Baden bei Wien
Baden bei Wien

Viennese Woods Region
Baden bei Wien

Baden – Facts & Figures

Population
- 25,284 principal residence
- 4,326 secondary residence

Total area of town  27 km²

Sea level  200-250 m

Location
- 26 km south of Vienna

Precipitation
- about 650 mm/year
Economy and tourism

- about 1,500 commercial and industrial enterprises
- 120 winegrowers and about 70 wine taverns (Heurigen)
- more than 400,000 overnight guests
Diversity of Baden

history
wine

health

culture
games & congress

gardens & nature
Emperors summer residence

Franz I (II) Emperor of Austria (1792-1835)
- spent his summers in Baden
- apprenticeship as a gardener
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Healthy water
Spa town since Roman times
14 sulphuric thermal springs produce nearly 5 million litres of high quality, natural sulphuric thermal water a day with an average water temperature between 30° and 36°C

Experience water public bath with sandy beach
Baden bei Wien

Historic Architecture

Cradle of Culture
Famous composers spent their time in Baden

- **Wolfgang Amadeus Mozart** (*1756 – 1791*)
  - 1791 *Ave verum* was first released in St. Stephans-Church
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- **Ludwig van Beethoven** (1770-1827) 15 long lasting stays in Baden
  - 1821 Missa solemnis and
  - 1823 9th Symphony - European Hymn-composed in Baden

- Beethoven’s original piano

- Beethovenhaus – House of the European Hymn

- Beethoven tempel in the Spa park
Baden bei Wien

- Waltz King Johann Strauß regularly gave concerts in Baden

In the park’s music-pavilion regularly concerts take place today
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Gardens & Nature
Baden bei Wien

Baden –
city of parks and green

Public green spaces - scalar

- 3,000,000 sq.m
- thereof 1,940,000 sq.m forest
  - 900,000 sq.m parks

- Spa Park 560,000 sq.m
- Rose garden 70,000 sq.m

about:
- 150,000 summer flowers
- 20,000 bulbs
- 90 gardeners

Mediterranean aspect in the Spa Park
Baden bei Wien

Der Badener Kurpark – The Spa Park
Baden bei Wien

- Since the 2nd century – Roman bathing resort, named „Aquae“, situated in the western part of the Spa Park (Römer- or Ursprungsquelle)
- 1758 construction Theresienbad with Theresiengarten

Theresienbad (built 1758)
Ursprungsbad (built 1796)
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Extensions:
1792 to a City-Park for all people
1806 to the North and Northwest (Alexandrovicz-Anlagen, Kalvarienberg)
1925/26 to the Northeast

Construction of the
1798 Aesculaptempel, renaming later to Mozarttempel
1841 Sommerarena
1843/44 wooden Pump room
1894 Musikpavillon
1903 Undine-Brunnen after the final completion of the Badener public water pipes
1927/28 Beethoven tempel
1928 Blumenuhr
1934 Opening of the Casino in the former kurhaus and 1966/66 modification of this building to a convention center

Setting up of different monuments
1874 Grillparzer
1899 Kaiser Joseph II
1912 Lanner-Strauß

1792 Plan of the City-Park designed by Jean Baptiste Barbé and Franz Grundgeyer
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The Spa park today
- green oasis in the centre of Baden
- traditional meeting place
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Rose-garden Doblhoffpark

- **opening:** 1969
- **area:** 70,000 sq.m
- **about:** 25,000 roses
- **rose varieties:** > 800
Doblhoffpark - a Renaissance-garden

since 1450
after 1750 modification first in baroque, later French style by Carl Hieronymus von Doblhoff

The Park around 1750
**Baden bei Wien**

The Austrian rose-garden comes into being

1967 – 1969 lay out of the Rosarium
since 1988 the park is declared as a natural monument
2010 Garden festival in Baden and the surrounding area
2009-2013 redesigning the rose-garden

The orangery after 1945

The orangery, the only baroque building of Baden saved after the great fire 1812
Baden bei Wien

- 2009/10 modification of the western part of the rose-garden
2012/13 further modifications in front of the orangery ...
Baden bei Wien

... and in the western part of the rose-garden
The new orangery-parterre

The rose-pergola

The lilies pond

„Flora“ – the goddess of flowers, youth and enjoyment takes in possession the Rosarium
Criteria of “Nature in the Garden”
(Natur im Garten is a campaign by the government of Lower Austria)

Aims

- no
  - chemical-synthetic pesticides
  - mineral fertilizer
  - peat
- planting of suitable varieties
- promotion of environmental consciousness
- beneficial effects on ecological cycle
Motivation to practice ecological maintenance

- recreation and relaxation within a healthy environment
- beneficial surrounding for employees
- environmental sustainability
- pioneering role of Baden in public green spaces
- implementation of the criteria of “Nature in the Gardens”
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Approach in the rose-garden

- Soil: understanding it as an organism
- Site: careful selection-sunny and a bit windy
- Plants: healthy varieties
- Treatment: strengthening the condition of
  - soil and
  - plants
  by using specific ecological products
In collaboration with the University of Agriculture, Vienna experiments in ecological treatment of roses using

- Beneficial organisms and useful creatures
- substances to strengthen the plants
- biological substances against different fungal infection

since 2012 ecological protection of all plants in the rose-garden ⇒ No pesticides, fungicides or herbicides in parks
Versuch über ökologische Pflegekonzepte bei Rosen


Die Maßnahmen richten sich gegen folgende Rosenkrankheiten und Rosenschädlinge:

- Sternraußtau
- Echter Mehltau
- Rosenrost
- Blattläuse

Das Projekt wird gefördert von der NÖ Landesregierung, Aktion Natur im Garten.

Projektpartner:
- Universität für Bodenkultur Wien
- Biohelp GmbH
- Stadtgemeinde Baden, Abt. Stadtgärten
- Stadtgemeinde Tulln

The gardener spreading out plant strengthenner
Prevention of fungal diseases

- watering roses in the early morning hours
- no top watering of the roses
- no daily watering, rather extensively in case of drought
- resistant varieties
- collection of fallen leaves in autumn

Variations of treatment during experiments 2011

<table>
<thead>
<tr>
<th>Variation</th>
<th>Product 1 combined with</th>
<th>Product 2</th>
<th>frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>variation 1</td>
<td>Cueva 0,4 %</td>
<td>Algovital 1 %</td>
<td>weekly till the end of May, then bi-weekly</td>
</tr>
<tr>
<td></td>
<td>Alginure 1 %</td>
<td>HF-Pilzvorsorge 0,2 %</td>
<td></td>
</tr>
<tr>
<td>variation 2</td>
<td>Myco-Sin 1 %</td>
<td>Equisetum Plus 1 %</td>
<td>weekly till the end of June, then bi-weekly</td>
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<tr>
<td></td>
<td>Steinhausers Mehltau 0,5 %</td>
<td>Milsana fl. 0,4 % + Trifolio 0,25 %</td>
<td></td>
</tr>
<tr>
<td>variation 3</td>
<td>Cueva 0,4 %</td>
<td>Algovital 1 %</td>
<td>bi-weekly</td>
</tr>
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Procedure of the experiments:
• spreading early in the morning
• weekly treatment at the beginning of the season (April), then fortnightly
• one half of the rose-bed with, the other half without treatment
• combination and change of products in different varieties

Testing period: left side with ecological treatment, right side without
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Rose testing

- in network with international test gardens
- the main testing criteria:
  - foliage
  - resistance against rose diseases
  - evaluation 6 times per year
  - maximum points: 100

Form in 3 kinds of forms for the different varieties of roses (shrubs and climbers, floribunda and teehybrids)
Important parameter for healthy roses

- **Substrate**
  - stable structure
  - deep infiltration
  - neutral pH
  - mulch with grass 3-5cm
  - annual use of organic fertilizer

- **strengthening of roses by**
  - avoiding weeds
  - using effective microorganism and plant extracts

- **plant protection by biological pest control with**
  - useful creatures
  - biological substances against different fungal infection

- **mix of rose varieties and other plants**— no monoculture
  (only partly possible in the rose-garden of Baden)

- **results of rose testing**: new bred roses are tested in the run-up to put them on trade
  the main criteria are resistance to diseases and frost, flowers, fragrance
Conditions for ecological protection

- qualification and engagement of employees
- constant monitoring the plants
- reaction on the first suspicion of any disease

AND

- INTERPLAY of
  - weather
  - varieties
  - substrate
  - plant site
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Park maintenance under ecological criteria

- more workforce for
  - monitoring
  - more frequent treatments
- more and diverse products, higher costs
- specifically qualified employees
- experiences of many years are necessary
- long-term experience is necessary
Weeds in gutters are not only an aesthetic question, the caused water erosion is a further problem.
Different methods to control weeds

- **by hand**, but very time- and labour-consuming
- **thermal weed control** using
  - hot steam by high pressure or hot water
  - infrared- or hot air- procedure
  - Flaming of weeds
- **mechanic weed control**
  - brushes, rollers with teeth, but not suitable for weeds in gutters
- **biological products** e.g. Finalsan
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testing different kinds of treatments

machine for weed flaming with gas

Testing WAVE:
spraying hot steam (98°C) on the weeds
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Watermanagement in the parks

2007  Planting of 100 new chestnut trees while preserving of the historical structure from 1792

further adaption of infrastructure for present needs

Plan of 1792
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- Rainwater run-off from the pathways in the lawns by lower sections in lawn beds
- Collection of water in gutters and storage surplus water in absorbing wells (9 à 10 cbm and 12 sand catchers)

Sprinkling system is necessary: for stabilisation within the first 3 years, in summer to avoid dust

Drainage – rainwater remains in the park
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The new planted avenue

Spring 2008

June 2014
Pathway technology without stabilizer

• used for:
  – footways
  – places
  – bicycle routes
  – less frequented car streets

Construction

<table>
<thead>
<tr>
<th>total height (40 cm)</th>
<th>grain size</th>
<th>layer in cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>overlay with stone chippings</td>
<td>2/4</td>
<td>3</td>
</tr>
<tr>
<td>cap without stabilizer</td>
<td>0/4</td>
<td></td>
</tr>
<tr>
<td>dynamic layer = 2\textsuperscript{nd} base course</td>
<td>0/16</td>
<td>12</td>
</tr>
<tr>
<td>1\textsuperscript{st} base course</td>
<td>0/45</td>
<td>25</td>
</tr>
<tr>
<td>substructure</td>
<td></td>
<td>≥ 45 MN/m²</td>
</tr>
</tbody>
</table>
Advantages:

+ permeability for water
+ durability
+ recyclable
+ lower surface temperature (asphalt reaches up to 80°C)
+ humidity on the surface improves the microclimate for visitors
+ walking is less tiring
+ lower costs

Needs:

– routine maintenance necessary – constant roll roughness
– permeability must be guaranteed for cycling water
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New ways of planting along streets

Borders with summer flowers - annuals

- produced energy-intensive in winter
- low ecological meaning for insects - mostly sterile
- watering necessary ⇒
  - resource allocation - employees and machines

production in the municipal glass houses
Baden bei Wien

Borders with perennials

- arrangements from early spring to late autumn
- plant diseases are insignificant
- diversity of habitats
- low CO$_2$-footpring
- almost no maintenance
- no watering
- almost no weeds
- no dangerous maintenance along streets
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Borders with perennials

Selection of perrenial plants
- Nepeta
- Salvia
- Delphinium
- Hemerocallis
- Iris
- Eremurus
- Grasses (Pennisetum, Miscanthus, …)
Publication: ecological plant protection

based on the results of the scientific studies since 2008 made in the rose-garden of Baden

year of publication: 2011

by Sabine Pleininger

Link:
http://www.naturimgarten.at/sites/default/files/oekologischer_pflanzenschutz_bei_rosen.pdf
Roses for gardens close to nature

by Gerhard Weber

year of publication: 2005

content:
• Ecological gardening with roses
• advices for combination roses and perennials
Rose-days every year in June –
- rose exhibition in the orangery
- information
- guided tours
- cultural program
- Rose Festival
Thank you for your attention!