Ecological maintenance in public and touristic parks

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Baden bei Wien







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







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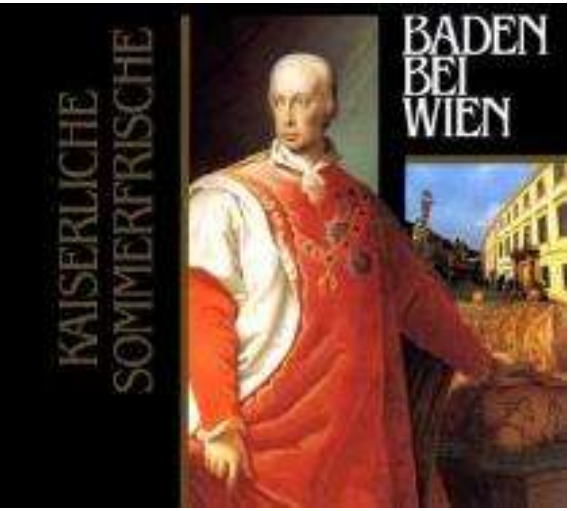
Economy and tourism

- 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

health

culture

wine

gardens & nature

games & congress

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







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Historic Architecture

Cradle of Culture

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Famous composers spent their time in Baden

- **Wolfgang Amadeus Mozart** (* 1756 – 1791)
  - 1791 Ave verum was first released in St. Stephans-Church

Mozarttempel

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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

Beethoventempel in the Spa park







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- **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

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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







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Der Badener Kurpark – The Spa Park

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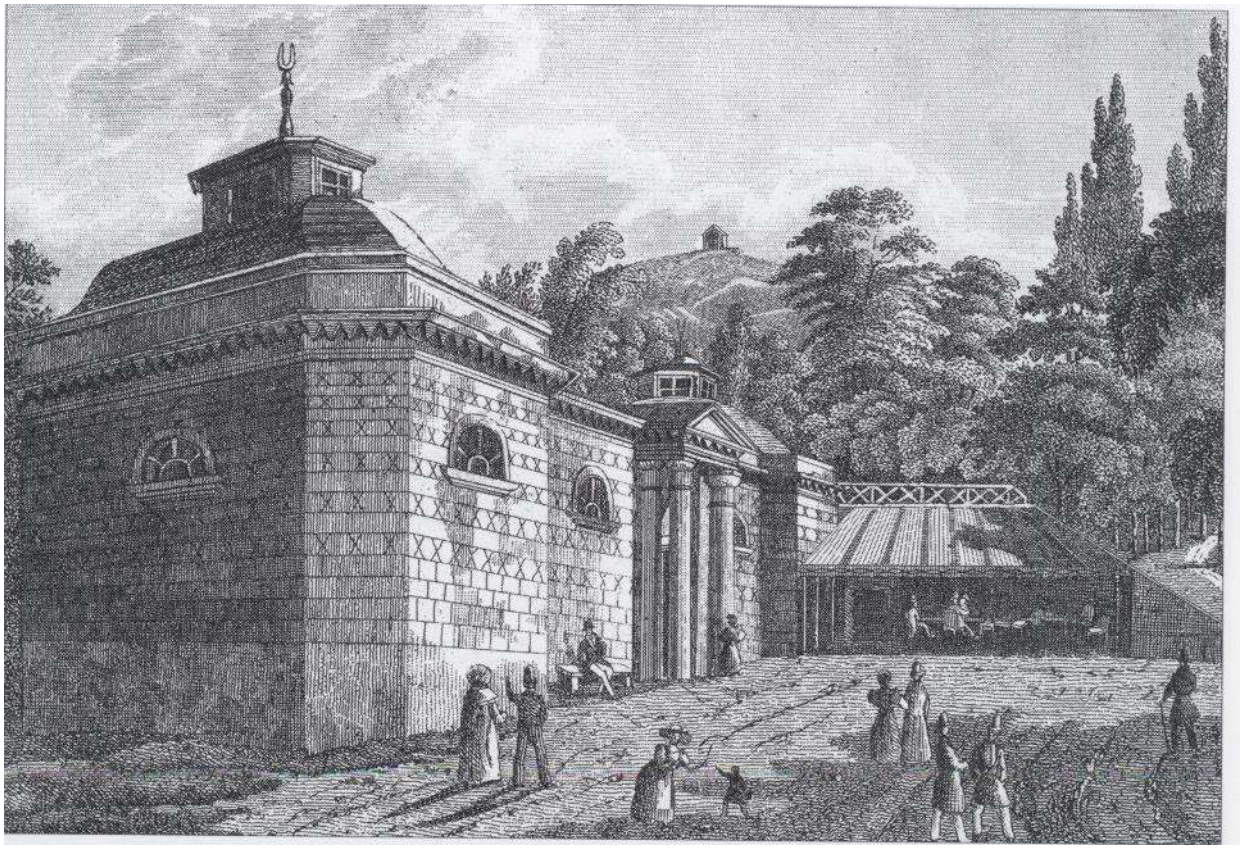
- since 2nd century – roman bathing resort, named „Aquae“, situated in the western part of the Spa Park (Römer- or Ursprungsquelle)
- **1758** construction **Theresienbad** with **Theresiengarten**



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 **Beethoventempel**
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







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Doblhoffpark - a Renaissance-garden

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

The Park around 1750







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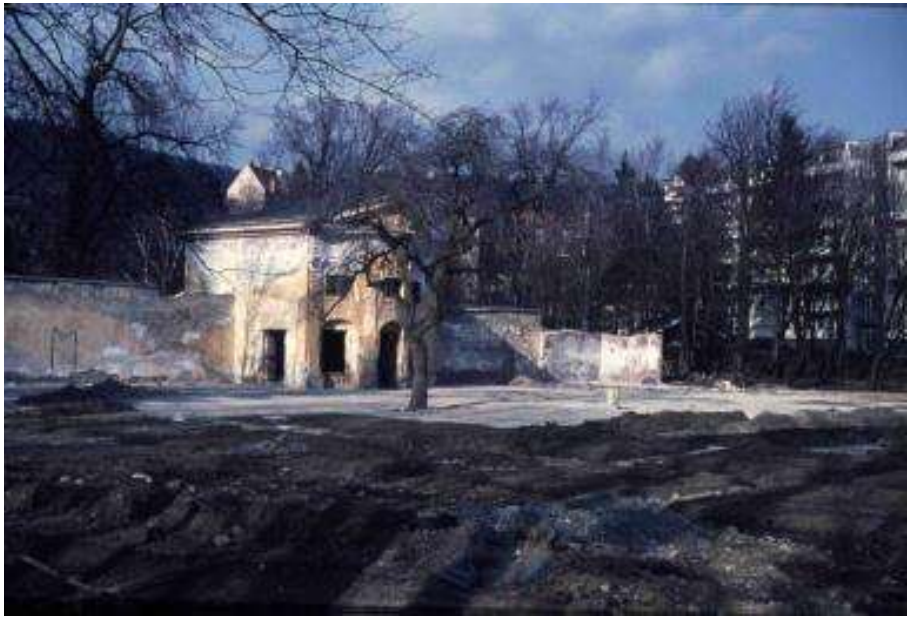
The Austrian rose-garden comes into being

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

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- **2009/10** modification of the western part of the rose-garden

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2012/13 further modifications
in front of the orangery …







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… 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







Ecological maintenance in our rose-garden

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”







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







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Scientific study “Ecological Park Maintenance” 2008-2011

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

grub of an Asian ladybeetle

since **2012** ecological protection of all plants in the rose-garden ⇨ **No** pesticides, fungicides or herbicides in parks







Information-board in the rose-garden - the ecological treatment of plants

Versuch über ökologische Pflegekonzepte bei Rosen

Auf diesen Rosenbeeten werden 2008 und 2009 Versuche zur Testung verschiedener ökologischer Pflegemaßnahmen durchgeführt, wobei der Schwerpunkt auf der Verwendung vorbeugend eingesetzter Pflanzenstärkungsmittel liegt. Unbehandelte Vergleichsflächen geben Auskunft über sortenspezifische Abwehrmechanismen und Entwicklungsunterschiede.

Die Maßnahmen richten sich gegen folgende Rosenkrankheiten und Rosenschädlinge:

Sternrußtau

Rosenrost

Echter Mehltau

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

Stadtgemeinde Baden bei Wien

biohelp

Tulln an der Donau

The gardener spreading out plant strengthener

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

	Product 1 combined with	Product 2	frequency
variation 1	Cueva 0,4 %	Algovital 1 %	weekly till the end of May, then bi-weekly
	Alginure 1 %	HF-Pilzvorsorge 0,2 %	
variation 2	Myco-Sin 1 %	Equisetum Plus 1 %	weekly till the end of June, then bi-weekly
	Steinhausers Mehltau 0,5 %	Milsana fl. 0,4 % + Trifolio 0,25 %	
variation 3	Cueva 0,4 %	Algovital 1 %	bi-weekly
	Alginure 1 %	HF-Pilzvorsorge 0,2 %	
	Myco-Sin 1 %	Equisetum Plus 1 %	







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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)

Polyantha-, Polyanthahybrid- und Floribundarosen

Österreichische Rosenprüfung Ort: **Rosarium Baden**

Richter:

ÖRP-Nr.: Züchter: Pflanzenzahl:

Züchter-Nr.: Züchtungsjahr: Pflanzdatum:

Ausfälle: ..... Stück, Zeit und Ursache: .....

		1. Flor			folgender Flor			M	Bemerkungen
Buschform	5								
Wüchsigkeit	10								
Belaubung	10								
Widerstandsfähigkeit gegen Blattkrankheiten	12								
Rispe	5								
Reichblütigkeit	15								
Knospenform	5								
Blütenform	5								
Blütendauer	9								
Selbstreinigung	8								
Farbe, Blütenöffnung	6								
Farbe, Blütenverblühen	6								
Duft	4								
Summe der Mittelwerte									
Neuheitenwert	+5								
Gesamtwert									

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Duft	4								
Summe der Mittelwerte									
Neuheitenwert	+5								
Gesamtwert									
Mittelwert des 1. und 2. Jahres									







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







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







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Weed control

weeds in gutters are not only an aesthetic question,
the caused water erosion is a further problem







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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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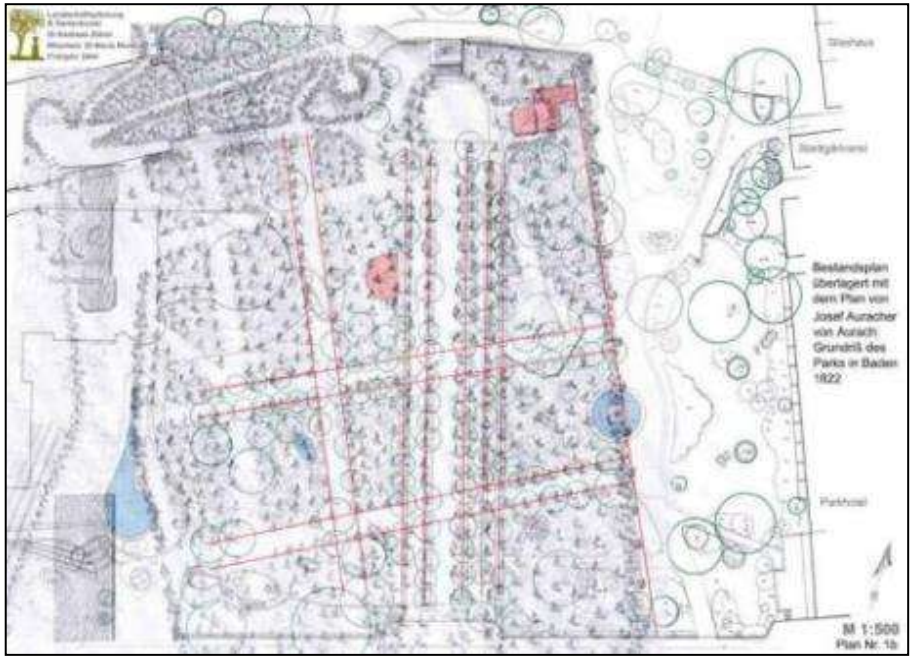
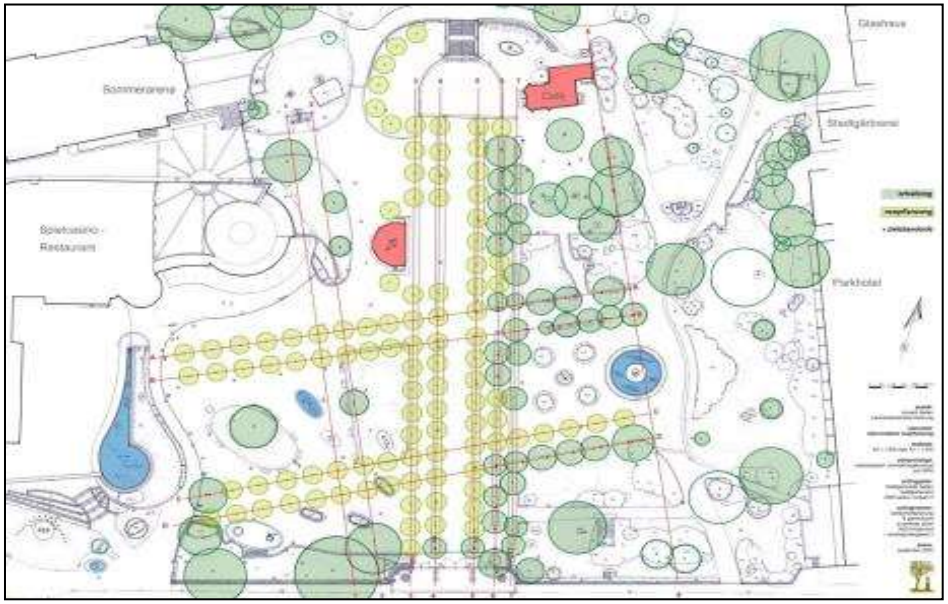
Watermanagement in the parks



Plan of 1792

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

further adaption of infrastructure for present needs









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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

total height (40 cm)	grain size	layer in cm
overlay with stone chippings	2/4	3
cap without stabilizer	0/4	
dynamic layer = 2st base course	0/16	12
1st base course	0/45	25
substructure	≥ 45 MN/m²	







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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

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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

<u>Selection of perenial plants</u>

- Nepeta
- Salvia
- Delphinium
- Hemerocallis
- Iris
- Eremurus
- Grasses (Pennisetum, Miscanthus,…)

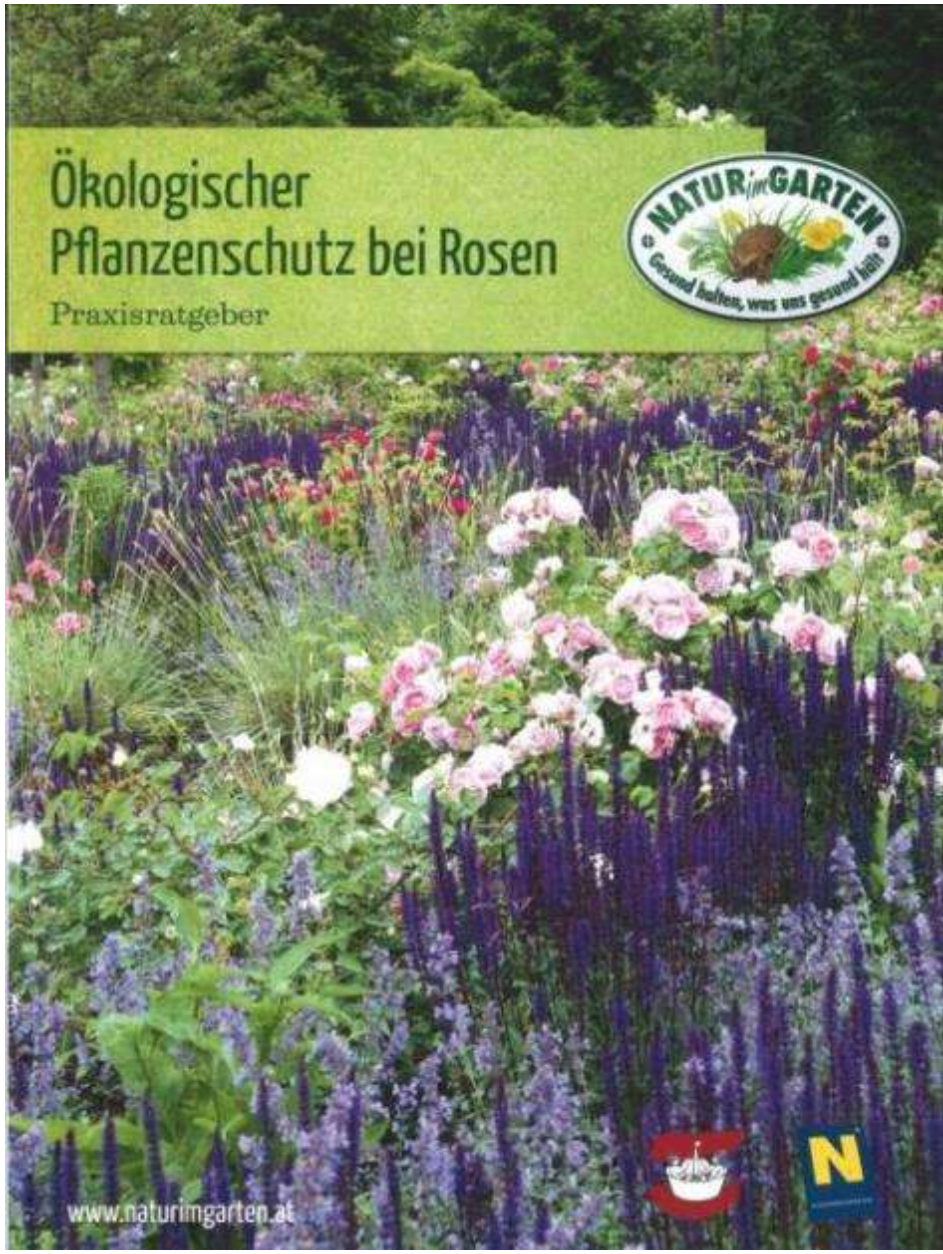
Publication :
ecological plant protection

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



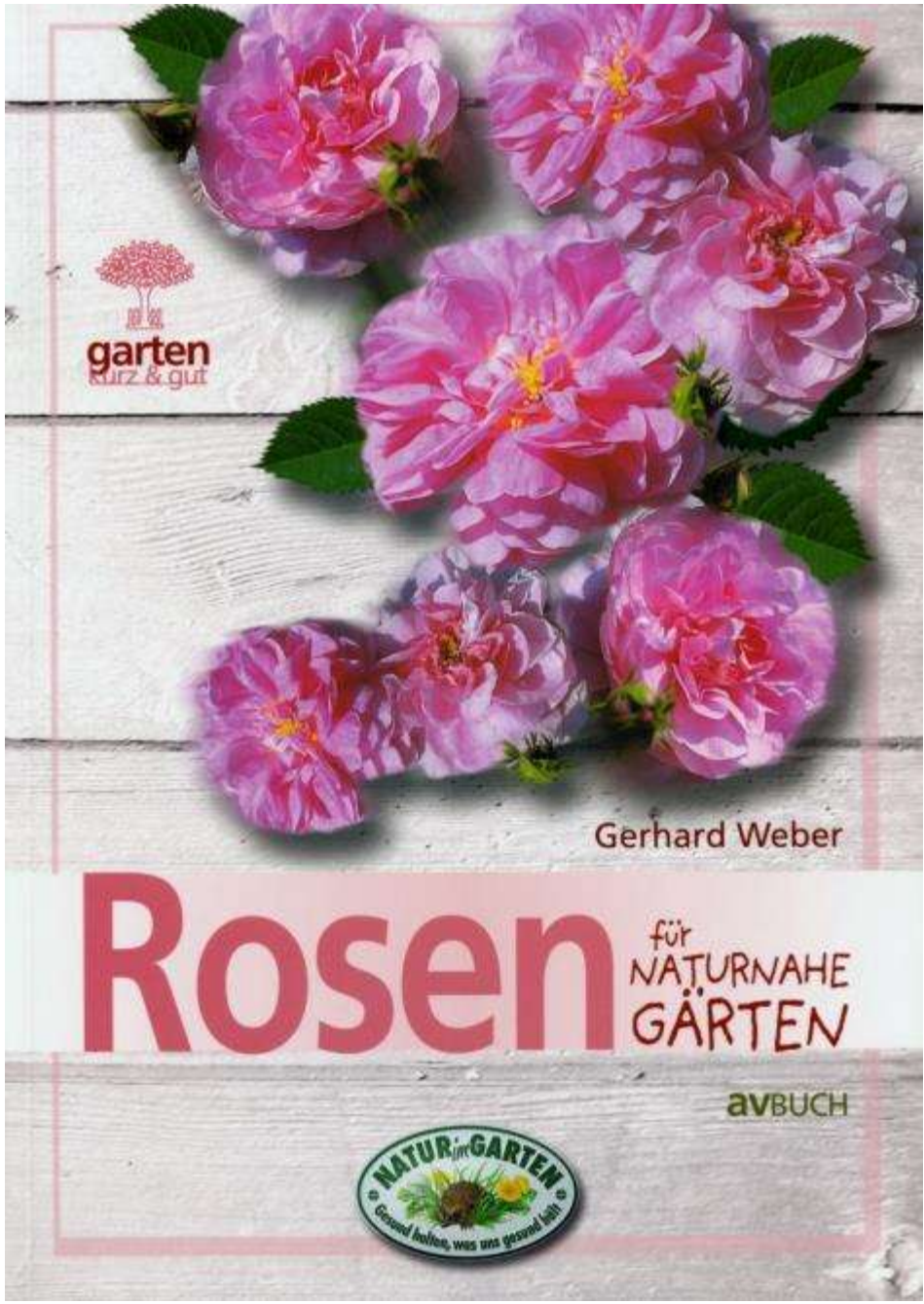
Roses for gardens close to nature

by Gerhard Weber

year of publication: 2005

content:

- Ecological gardening with roses
- advices for combination roses and perennials



Baden bei Wien


rose exhibition in the orangery

Rose-days every year in June –

- rose exhibition in the orangery
- information
- guided tours
- cultural program
- Rose Festival


Rose Festival







Thank you for your attention!