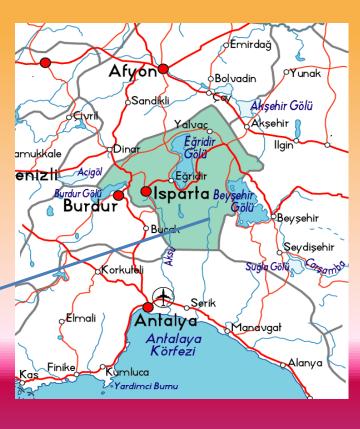




#### ISTANBUL TO ISPARTA >





#### Turkish Rose Oil Facts

- Origins of Rosa damascena Mill date from Neolithic period
- Roses are native to this area and were taken by the Ottoman's to Bulgaria some 300 years ago.
- Legend has it that the rose is born from drops of Mohammed's sweat
- There are many references to the cultivation and use of roses throughout the middle ages throughout Persia, Middle East and Central Asia
- The Bulgarian Rosa damascena is from the same original rootstock as the Turkish and does not exhibit any genetic diversity however other locations (Iran, Morocco and Andalusia) show other genetic variations

#### Rose oil production around Isparta

- R. Damascena is a naturally occurring hybrid from Rosa gallica and Rosa phoenica.
- Some texts state R. Gallica
  + R. Moschata (musk rose)
- Named after the city Damascus
- The rose is picked from here before fully opened



#### Rose Oil Production-Facts and Figures

- Dawn-10.30 am time when roses harvested
- 10-15 kg amount each picker harvests per day
- \$5 (NZ) approx per kg each picker paid
- 3-6 weeks picking time (mid may-early June)
- 66 Acres in total around Isparta
- 1-5 hectares size of average farm
- 3500 kg petals =1 kg Otto
- 0.025% yield for Otto
- 0.25% yield for concrete
- 0.1% yield for absolute
- 7500 tonnes rose petals harvested annually
  - 1200 kg rose oil (4200 tonnes petals)
  - 3000 kg concrete
  - 1500 kg absolute (approx)
  - 100 tonnes rose water (most used in mosques)



# The field we picked (7.30 am!)













At the distillery...





The fresh petals from that day are laid out to dry for 24 hours for solvent extraction of the absolute (2 floors high)



#### Solvent Extraction



Flowers + Solvent (hexane)



Concrete +alcohol



=absolute
 (wax
 residue
left over)

# Then hopper for the petals to begin absolute production with a vat full of hexane



# These vats contain alcohol to wash concrete to extract absolute



# The spent petals after solvent extraction





Produces concrete → absolute +wax

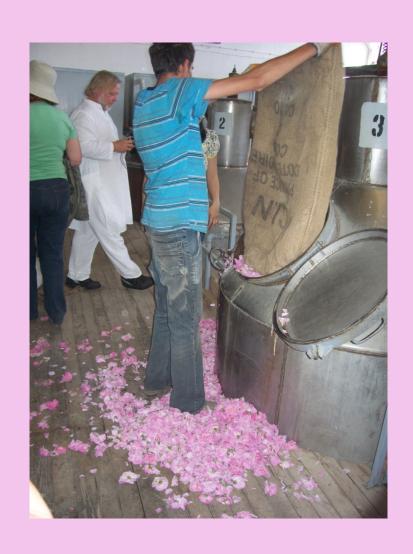
#### Rose Otto Production

 Fresh flower petals added directly to vats for hydro distillation





#### The vat is filled and sealed





# One floor below and the process begins and last 60 mins (approx) until oil appears

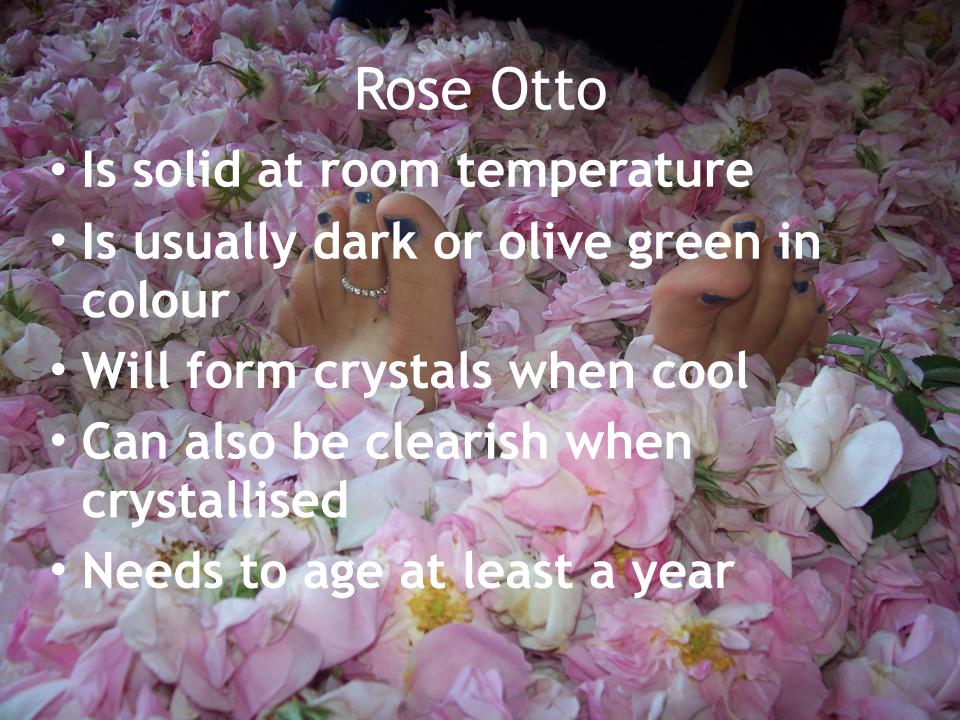




1 of 32 stills in operation in the entire plant

#### Rose Otto production technical detail

- Vaporised water plus oil exit the still into a condenser
- Oil is collected at this stage-very concentrated and makes up about 20% of final product
- Cohobation occurs where water I redistilled to get water sol. Fractions (e.g. Phenyl ethyl alcohol)
- The product from cohobation (80%) is added to the 20% to make Rose OTTO remaining water is the hydrosol



# Rose absolute, Otto and rose water concentrate





## My precious goods





#### Thanks for your attention







#### References

- (a) Touw, M (1982). Roses in the Middle Ages, *Economic Botany*, 36 (1), 71-83
- (b) Babael, A. et al (2007). Microsatellite analysis of Damask rose (*Rosa damascena* Mill.) accessions from various regions in Iran reveals multiple genotypes, *Plant Biology*, 7:12, 1471-2229
- For tour details go to <u>www.aroma-</u> tours.com



# Some photos to finish with-Enjoy! Turkey- a land of colour, laughter, passion and history...

# Scented broom at Anzac Cove at Gallipoli...



#### Graveside Helichrysum at Gallipoli



## Wild poppies at Troy



## Opium poppies...





# Colourful Carpets...







Yes they even do flying carpets!



## Ceramics and pottery...







#### View from the air...









## The spices...







## The clothing...







## The people...







# The Architecture...

















# The History...









#### Natural Wonders...





# Thank you!







