

SMP21.31–Sustainable flower transport from Kenya

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December 9, 2021

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Sea transport of flowers

- For several reasons sea transport is preferred above air transport (CCC)
 - Lower Carbon footprint
 - Lower Cost
 - More Capacity and flexibility
- Not all flowers (roses!) can be transported/stored for up to 35 days without unacceptable quality loss
- Proper treatments and protocols need to be developed

Sea transport of flowers

■ Aim of project

- Inventory about current bottlenecks in the sea transport chain of flowers (roses) from Kenya to Rotterdam
- Pilot experiment to verify to what extent outcome of shipment is dependent on **Grower** and on **Cultivar**
- Development of a follow-up research plan (PPS) to improve the sea-transport protocols

Consortium

FlowerWatch, Roelofarendsveen



Xpol BV, Rijsenhout



Royal Flora Holland, Aalsmeer



Chrysal International, Naarden



De Ruiter Innovations, Amstelveen



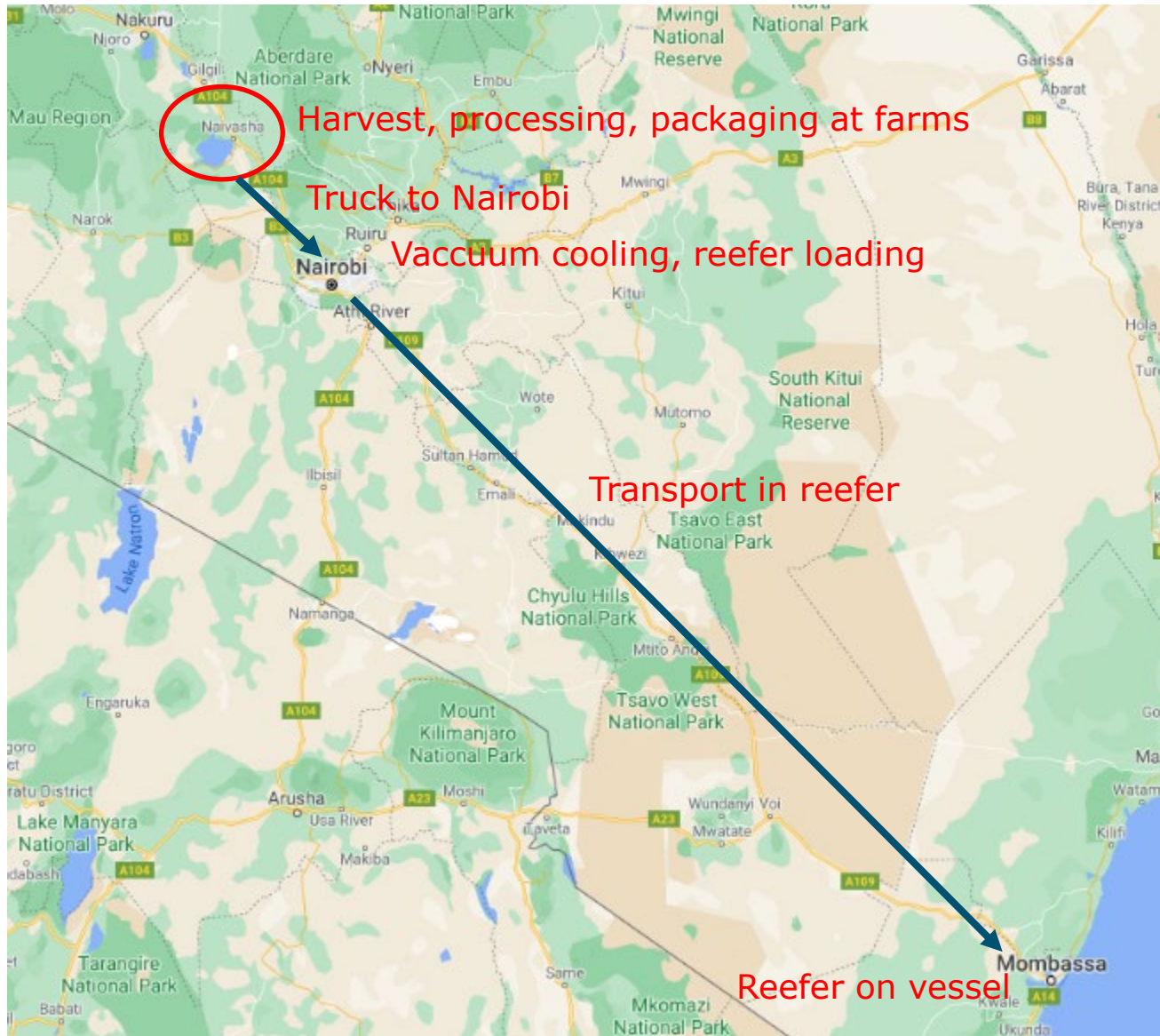
De Ruiter East Africa, Kongono, Kenya

Wageningen Research: Food and Biobased Research
Wageningen Research: Greenhouse Horticulture



Four Kenyan rose growers were involved in the project

Experiment (pilot shipment)



Pilot shipment (summary)

- 7 rose cvs were sourced from 4 growers
- After harvest all flowers were **treated, stored, handled, packed** in same way
- By truck from Naivasha region to Nairobi, vacuum cooled and loaded in reefer container and trucked to Mombasa
- Reefer loaded on vessel and shipped to Rotterdam
- Conditions in reefer monitored (CO₂, Temp, humidity)
- At arrival: re-hydration, retail and vase life simulation in Wageningen and in Bleiswijk
- Quality assessments of flower (especially leaf quality, flower opening and vase life)

Transport conditions as similar as possible



Dataloggers in boxes,
boxes labelled, same
position in pellet
(third layer from top)



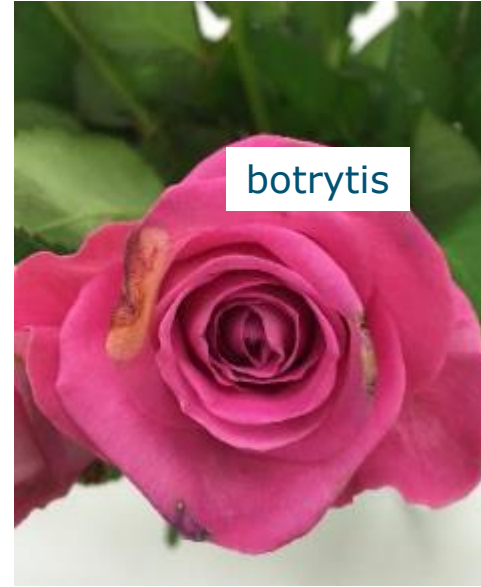
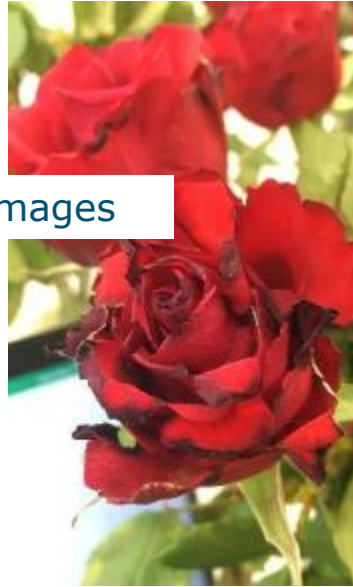
At arrival



Some Quality problems during vase life



Petal damages



botrytis



Leaf spots



Leaf desiccation



Stem damages

Quality problems at arrival

- How do the quality problems relate to the genotype (cultivar) and to the source (grower)?
- In this experiment:
 - Some cvs performed better than others, irrespective of the grower
 - Flowers from some growers performed better than from other, irrespective of the cultivar
- Note: All these cultivars generally perform well, irrespective of the grower, when they are transported by airplane
- It seems there are both genetic and environmental factors that determine the response to long-term cold storage

Follow up: PPS project **LWV21.125**

3 year project, total project budget Euro 720K

- Verify these findings and further analyse the possible (physiological/ environmental) reasons for differences in performance
- Develop improved methodologies for pre- and postharvest handling/treatments
- Improve container settings and conditions
- Develop decision models to optimize outcome and to make rational decisions between transport modes (cost, quality and sustainability)
- **Outcome of project will assist in making the large scale transition to sea transport**