INTRODUCTION TO TRELLIS SYSTEMS FOR GRAPEVINES IN AFGHANISTAN

Improving yield and quality

Andrew Teubes
Viticultural Consultant
Grape fruitfulness

- Fruitfulness = potential of vine to yield fruit
- Two main factors influence fruitfulness
  - **Sunlight** on leaves of buds during spring period, especially during *flowering* and *fruit set*
  - **Temperature** during *flowering* and *fruit set*
- Any trellis system that will increase the sunlight exposure of the leaves will result in increased fruitfulness, and therefore higher yield
Types of trellis systems

- Bush vines (traditional) – no trellis
- Vertical systems
- Semi-horizontal systems
- Horizontal systems
- Unconventional systems
Kandahar, Helmand
Why bush vine and not trellis?

- Reasons for bush vine cultivation
  - Soil potential medium, therefore do not expect high vigour in plants (shoot growth stops naturally at 70-80 cm length)
  - No irrigation or low availability of irrigation water
    - Bush vines naturally yield smaller crops than trellised vineyards
  - No capital available for installation of trellising materials (poles, wires, anchors)
Advantages of bush vines

- Low cost
  - No expensive capital investment required
Disadvantages of bush vines

- Low yield potential
  - No support for shoots for increased sunlight
- Disease control not effective
  - Poor ventilation (air movement) and sunlight penetration
- Weed control very difficult (only by hand)
- Grape clusters have lower quality
  - Temperature of clusters higher close to soil surface
  - Physical damage to clusters close to soil
  - More dust on clusters
- All labour activities problematic
  - Pruning, shoot removal, leaf removal, harvesting
Grape clusters very close to soil

Physical damage

Sun exposure – sun burn

Dust
Disease control
- no airflow
- no sunlight
Labour activities and movement highly restrictive

Weed control difficult
Advantages of trellising

- Vine has natural climbing growth habit; trellis provides larger surface area for growth and fruiting
- Increase yield potential
  - Allows differential pruning techniques (spurs and canes)
- Increase quality of fruit
  - Above soil surface, no dust or physical damage
  - Lower temperature of clusters
- Easy management and mechanization
  - Weed control
  - Disease- and pest control
  - Labour
Management advantages

Clusters have protection
- sun
- dust
- physical damage

Easy control of weeds

Comfortable height for working and picking grapes
Vertical Shoot Positioning (I-trellis)

South Africa

Chile
Semi Horizontal (Y-trellis)

Turkey

Mexico
Semi Horizontal (Double Gable)

South Africa
Horizontal (T-trellis)

South Africa

Saudi Arabia
Pergola
(Roof trellis)

Chile

South Africa
Unconventional systems

- When are they used?
  - When trellis materials are not available or too expensive (poles, wires)
Egypt

Reeds from Nile River is used as trellising material
Samangan
China
Uzbekistan
Systems for Afghanistan

- 2 systems
  - Vertical system (I-trellis)
  - Horizontal trellis (T-system)
- Easy to construct
- Relatively cheap
Typical I-trellis design
Soil surface

Pole length = 2.3 m

TRELLIS SYSTEM DIMENSIONS

Foliage wire

Cordon wire

Soil surface

60 cm

35 cm

35 cm

90-100 cm

60 cm
Management of the I-trellis

1. Ground preparation
2. Planting rows
3. Shoot growth
4. Shoot tipping 40 cm above top wire
Position of clusters
Management of I-trellis

Tipping of shoots to maintain vertical shoot orientation

-sunlight penetration
Basic T-trellis design
Total length of post = 2.3 m

Depth in soil = 60 cm

Width of T-piece = 100 cm

4 foliage wires
Position of clusters
When will we use I and when T?

- T-trellis has more production capacity than I-trellis
  - But we require more irrigation water and fertilizer – is this available?
- Varieties requiring cane pruning (Shundulkhani, Kishmishi) will reach full potential on T-trellis (more space for canes)
- Varieties requiring spur pruning (Taify, Husseini) can reach high yields on I-trellis
- Row spacing of 2 m – more suitable for I-trellis
- Row spacing of 2.5-3 m – more suitable for T-trellis
Distance between rows = 3 meters

Soil surface

1.5 m
Require an “open” working space
Summary

- Trellising will greatly improve the production potential of the vineyard and quality of the fruit.
- Management practices are easier with trellis than without – pruning, weed control, harvesting.
- All vineyards are not suitable for trellising; make sure you have adequate water supply for irrigation.