## Training Systems for Grape Vines

### Systems for Vines with a Trailing (procumbent) Growth Habit

### Head (long cane) Training Systems:

#### 4 and 6-cane Kniffen:
- **Advantages:**
  - Ease of pruning to long canes.
  - Vertical distribution of fruit.
  - More compatible with tolerating winter injury than cordon systems.
- **Disadvantages:**
  - Requires annual tying of canes.
  - Difficult to maintain quality on lower wires (shading).
  - Not compatible with systematic leaf removal & shoot positioning.

#### Umbrella Kniffen:
- **Advantages:**
  - Easily to learn system.
  - Fruit high, distributed and well exposed.
  - Simple trellis construction.
- **Disadvantages:**
  - Requires of annual tying of canes.
  - Less adaptable to shoot positioning.

#### Keuka High Renewal:
- **Advantages:**
  - Very compatible with frequent replacement of vine parts in response to frequent winter injury.
- **Disadvantages:**
  - Requires of annual tying of canes.
  - Difficult for inexperienced pruners.
  - Not adaptable to systematic leaf removal & shoot positioning.

### Cordon Systems:

#### Single Curtain Bi-lateral Cordon (High Trellis):
- **Advantages:**
  - Adaptable to mechanical pruning, unskilled manual pruning, and mechanical shoot positioning.
  - Fruit are high for good sun exposure.
  - Requires little annual tying.
- **Disadvantages:**
  - Tends to reduce vine vigor, especially if shoots are positioned.
– Difficult to establish cordons where there is frequent winter injury.
– Old cordons hard to remove from wires.
– Old cordons may become a reservoir for diseases.

**Geneva Double Curtain:**
- Advantages:
  – Method to handle high vigor vines.
- Disadvantages:
  – Requires additional labor to shoot position.

**Systems for Upright and Semi-upright Growth Habits**

**Head (long cane) Systems:**

**Goyut:**
- Advantages:
  – Fruit can be situated relatively low to ground where it may benefit from radiant heat.
  – Minimal vine structure makes it easy to cope with winter injury to vines.
  – Long canes retain more fruitful nodes.
  – Can be converted to a mid-wire cordon system.
- Disadvantages:
  – Difficulty in pruning & harvesting if low to ground.
  – Possible congested fruit zone.
  – Greater risk of spring freeze injury(?)

**Pendlebogen:**
- Advantages:
  – All the benefits of Guyot, plus…
  – Arching of canes creates better vertical distribution of fruit on the trellis.
  – Relatively few ties per vine.
  – Can be spur pruned for next 1-2 years.
  – Can bury canes for winter protection.
- **Disadvantages:**
  – More challenging if fruiting wires are low to the ground.

**Fan:**
- Advantages:
  – Maximum flexibility to adjust to frequent winter injury.
  – Minimal retention of permanent vine parts.
  – Easily to learned.
  – Can bury canes for winter protection.
- Disadvantages:
  – Requires annual tying of canes.
  – Not adaptable to systematic shoot positioning or leaf
removal.
– Fruit can be hard to find and harvest.

**Cordon Systems:**

**Mid-wire Cordon:**

- **Advantages**
  – Ease of establishment (2nd year Guyot!).
  – Adaptable to unskilled manual pruning.
  – Little tying required.
- **Disadvantages**
  – Fruiting zone may become crowded and shaded on large vines.
  – Nodes on fruiting spurs may be of lower quality.
  – Bud counts may be low during renewal years.
  – Often requires post extensions.

**Low Cordon:**

- **Advantages:**
  – Fruiting zone close to ground utilizes radiant heat to promote ripening.
  – Low fruiting and renewal zone utilizes snow cover or artificial covers to avoid winter injury.
- **Disadvantages:**
  – Difficult on labor - low to ground.
  – Requires excellent weed management.
  – Soil residues on fruit.
  – Spring freeze susceptible.

**Smart-Dyson:**

- **Advantages:**
  – Adaptable to mechanical pruning.
  – Uses shoot positioning to expose fruit for ripening.
  – Less likely to develop differences in fruit maturity and bud quality than with Scott Henry system.
- **Disadvantages:**
  – Requires excellent weed management.

**Head or Cordon Systems or a Combination:**

**Scott Henry:**

- **Advantages:**
  – Promotes a systematic display of a large canopy and good exposure of fruit to sunlight.
  – Well organized fruiting zones are easy to hand harvest.
- **Disadvantages:**
  – Fruit maturation in lower fruiting zone is often behind the upper.
– Canes and buds developing in lower portion of trellis are of inferior quality.
– Complicated shoot positioning is required.
– Tall trellis is required.
– No advantage to weak vines.

Lyre:
• Advantages
  – Excellent distribution of the grapevine canopy.
  – Desirable upward growth of all shoots.
  – Good exposure of fruit for ripening.
  – Adaptable to mechanical pruning.
• Disadvantages
  – Complexity and expense.
  – Extensive shoot positioning required.

Mini J:
• Modification of the fan system.
  – A semi-permanent trunk is developed.
  – Trunk is positioned low to the ground to better facility removing it from the wires and burying it for winter protection.
  – Can be head or cordon pruned.

Sources of Information:


Tomesh, R. Growing Grapes in Wisconsin. On Wisconsin Grape Growers Association web site Article of Interest
