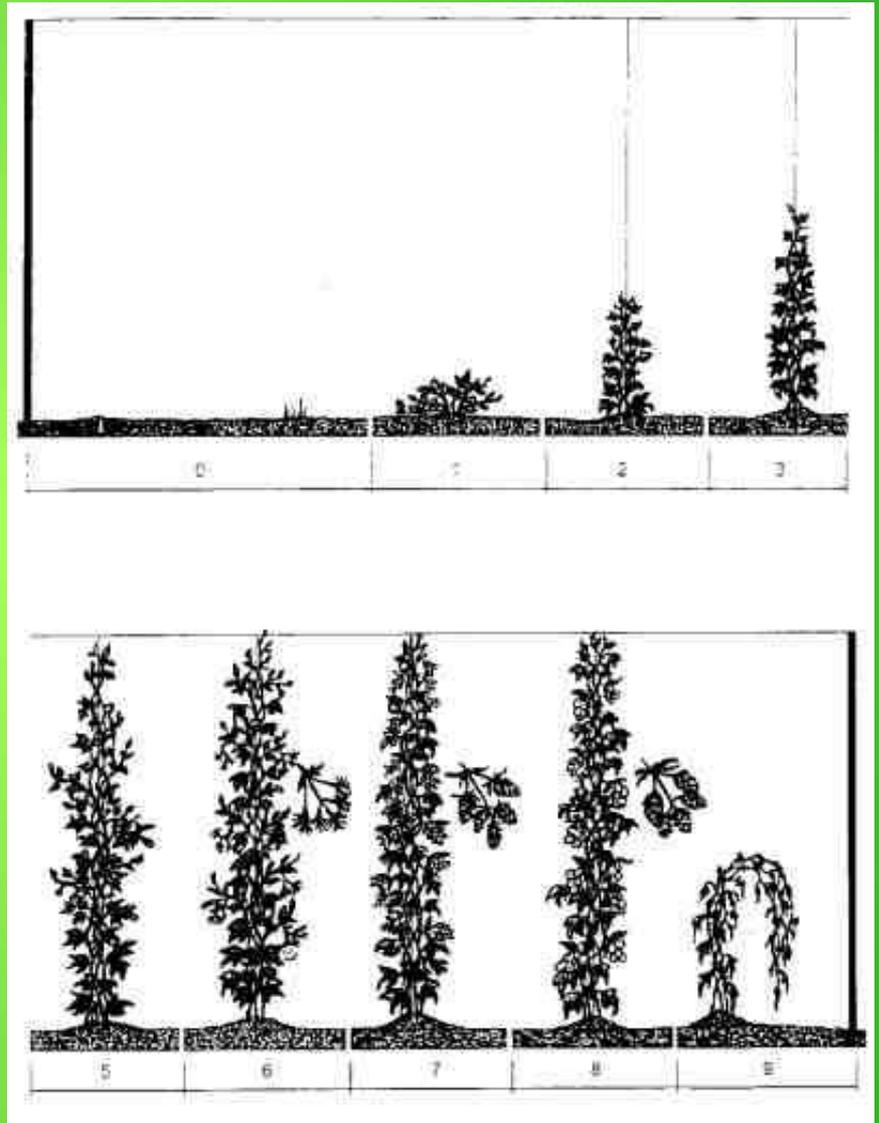


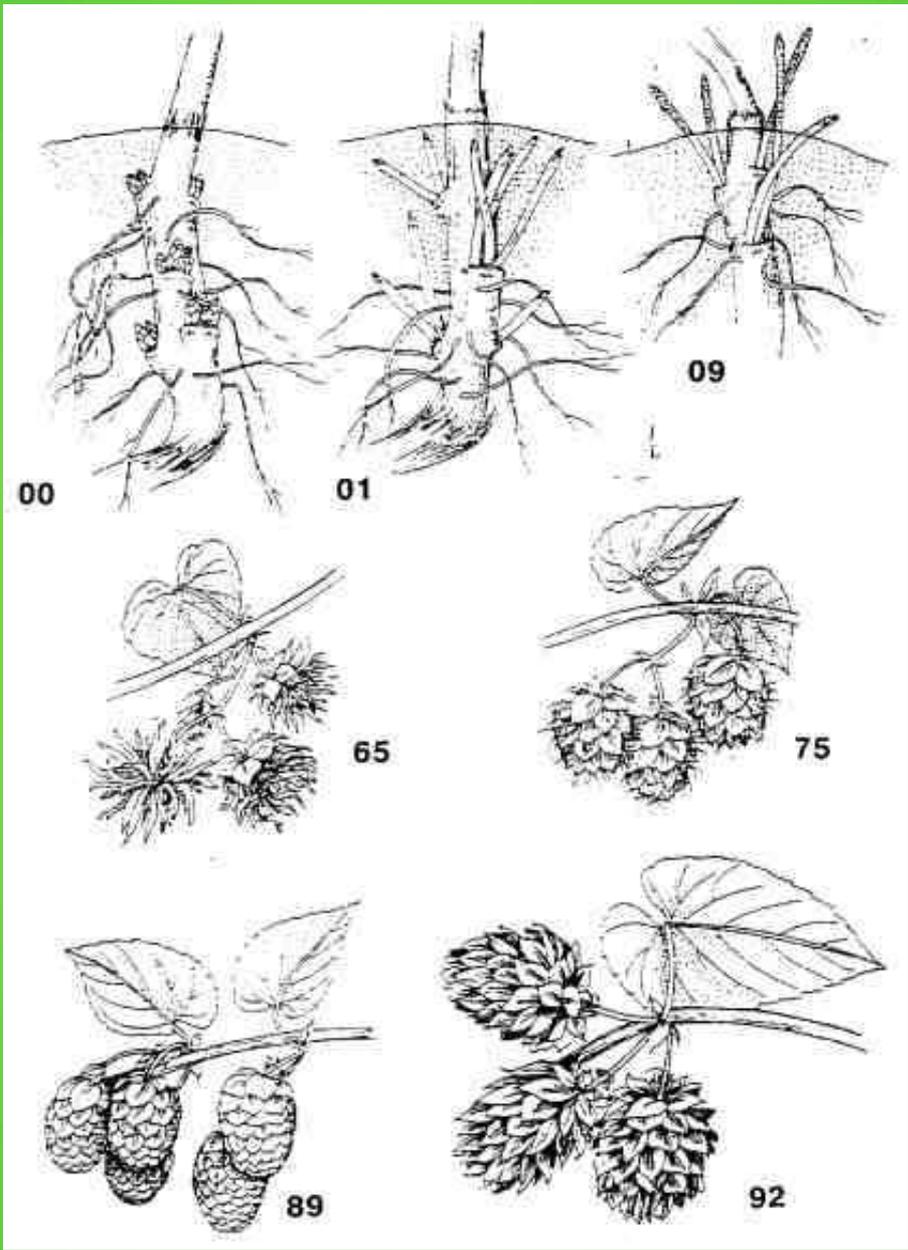
# Hops (*Humulus lupulus*)

**Growing, Feeding, Picking and Storing**

# Growth Stages

- 0: Sprouting
- 1: Leaf development
- 2: Formation of side shoots
- 3: Elongation of bin es
- 5: Inflorescence emergence
- 6: Flowering
- 7: Development of cones
- 8: Maturity of cones
- 9: Senescence, entry into dormancy







# Planting and Trellising

- North facing position for plenty of sun
- They will grow on anything and can be trained close to horizontal
- Separate plants by 1m and varieties by 2m
- Conventional
  - 6m high, poles with wires between
  - Sting from wire to ground
- Low Form
  - Suited to suburbia
  - Hops cage, compact but tangled

# Growing

- Trim back to 2-4 shoots per plant, keep cutting back new shoots
- Train clockwise around support system
- Letting too many vines grow makes for a tricky harvest
  
- Pests and Disease
  - Mildew
  - Red spider mite





**Some Basic Hop Trellis Designs**



# Water Needs

- Hops need 600-700 mm of water in the growing season
- Hobart rainfall Sept-Mar 350 mm
- Need 300 mm irrigation, 300 L/sq. m
- Deep watering every few days
- Avoid water logging the roots, good drainage matters

# Fertiliser Needs

- Soil pH 6.0-7.5
- Nitrogen
  - 45-65g/plant = 0.5L fish emulsion or 1.5kg Rooster Booster or 140g Urea (45% N)
  - Taken up by January
- Phosphorus
  - 10g/plant
  - Keep it in check, use low P fertilisers
- Potassium  
35-65g/plant
- Ideal Hops fertiliser has NPK ratio 5:1:4, but in higher %. Powerfeed for flowers and fruit 10:2:9 use 500mL/plant/year

# Harvesting

- When to Harvest
  - Feel and sniff
  - Moisture, 20-22% Dry Matter
- How
  - Cut and pick
  - Selective picking
- Leave some growth to die off, then cut back to ground level and bury in compost.

# Drying and Storage

- Drying
- 1 kg wet hops yields about 240 g dried hops.
  - Heat assisted, up to 60°C
  - Low and Slow, air temp thin layer moving air
  - Target 8-10% moisture
  - Too wet can cause mould, too dry they shatter
- Storage
  - Vacuum, inert atmosphere, low temperature, dark

# Testing

- Home techniques
  - Hop teas from known alpha-acid hops
- Laboratory, there is no one local.
  - Titration
  - HPLC
  - UV-Vis

# Useful references

[More Beer: Hops in the Backyard](#)

[Hop BBCH Scale, Rossbauer et al., 1995](#)

[University Vermont Hops Harvest Moisture](#)

[Michigan State University Drying hops on a small scale](#)