**Pulmonaria**

*Boraginaceae*

**Species and Cultivars**

- 12-14 rhizominous species
  - *P. angustifolia* — *Blue Lungwort*
  - *P. longifolia* — *Long-Leafed Lungwort*
  - *P. rubra* — *Red Lungwort*
  - *P. saccharata* — *Bethlehem Sage*
  - *Mrs. Moon*

- Used for shade and rock gardens, ground covers, edging/borders
- In the south most species are evergreen, provides interest in the garden all year
- Pest/Disease free; susceptible to powdery mildew if poor air circulation
- Flowers have interesting color ranges; and may change from blue-pink to blue as they age

**Pulmonaria saccharata ‘Mrs. Moon’**

**Propagation**

- Division and Tissue Culture are the primary methods
  - Division
    - Best time to divide in fall, but can be divided in the spring after flowering
    - In the fall, divide, pot, and winter in one gallon containers
    - In the spring, bare-root transplants, purchased from commercial propagators are potted
    - Move to cold frame and grown at a minimum night temperature of 55°F
    - Warmer night temperature, initially, help to produce a more uniform crop
    - Once roots established, night temperatures can be dropped to 50°F to harden off crop
  - Salable, leafed-out plant in a gallon pot in 8-10 weeks
  - Tissue Culture
    - An up and coming method that shows promising commercial importance in the future

**Pulmonaria saccharata ‘Mrs. Moon’**

**Schedule**

- Mar 1: Bare-root transplants potted, night temp. 55°F week 1
- Mar 15: Begin fertilization, (15-0-15) 150 ppm week 3
- Mar 31: Drop night temp., night temp. 50°F week 5
- April 8: Change fertilizer rate, (20-10-20) 200 ppm week 6
- April 26: Salable week 9

**Helleborus**

*Ranunculaceae*

**Species and Cultivars**

- 2 types of *Helleborus*
  - Rhizomes and Radical leaves (acaulescent)
    - *H. orientalis* — *Oriental Hellebore*, *Lenten Hellebore*
    - *H. cyclophyllus* — *Grecian Hellebore*
    - *H. multifidus* — *Much-divided Hellebore*
    - *H. torquatus* — *Archer-Mind Serbian Hellebore*
    - *H. niger* — *Christmas Rose*
  - Surface stemmed
    - *H. viride* — *Balkan Hellebore*
    - *H. foetidus* — *Stinking Hellebore*

- Originally many *Helleborus* species had greenish-yellow flowers
- Breeding now has wide range of colors - Pink, Red, Whites, Spotted
**Helleborus niger**

**Propagation**
- **Divisions**
  - 2-4 leaves from division to flower
  - Stemmed species harder to propagate by division
  - *H. niger* needs more 3 crown division
- **Seed**
  - Seed to grow out to see flower color if hybrid; discard bad ones
  - Seed must be sown before it goes dormant and dries out July/August
  - Source open flat lightly cover pH 5.8-6.5; no light or fertilizer requirements
  - Cold stratification for 10-12 weeks
  - Germination begins when temperatures reach 40-50°F
  - Transplant early before root elongation
  - Use 1:1.3 with each irrigation
  - NPK 4:1:2 ratio
- **Tissue culture**
  - An up and coming method that shows promising commercial importance in the future

**Schedule**
- **July/Aug** Sow seeds 6-12 weeks 60-85°F
- **Oct/Nov** Cold stratification cover 10-12 weeks 25-40°F
- **Feb/Mar** Germination
  - Transplant in 72 plug cells
  - in cotyledon stage
- **Mid April** Place plug tray in 50% shade
  - 60-70°F
- **Late Spring** Transplant to 4.5" pots
  - 8-10 weeks
- **July/Aug** Salable

**Species and Cultivars**
- **12 Well Known Commercially**
  - *All Yellow Flowers 1-8", Height 12-38"
    - 4 popular species
      - *I. ensiflora* no common name
        - Blooms 6-8", complements Buddha in landscape
      - *I. montana* "Arnica"
        - Blooms 3-2", medicinal uses as well as ornamental
      - *I. speciosa* "Swordleaf Inula"
        - Blooms 1-2", medicinal uses as well as ornamental
        - Considered best ornamental species vegetatively, as well as for its heat tolerance, and long bloom time.
      - *I. magnifica* "Elecampana"
        - Blooms 6-8", complements Buddha in landscape
        - pubescent foliage with a silvery appearance
  - "A clump-forming perennial native to Europe and Asia
  - Foliage: semi-evergreen with elliptic-lance shaped leaves
  - Growth Habit: Hardy in zones 3-7
  - Requires full sun
  - Grows best in moist well drained soil but can grow in "bogged" soils

**Inula**

**Asteraceae**

**Inula ensiflora**

**Propagation**
- **Division**
  - Inula ensiflora should be divided every 3-4 years
- **Seed**
  - Seed should be sown in sand
  - Sow seeds under 1/8" of soil and 4" apart
  - 15-20 days until seed germination or emergence
  - Transfer to 4" pots when plants are 2-3"
  - Soil pH should be maintained between 5.8-6.3 and monitored frequently
  - Propagation temperature should be 70-75°F until germination, then seedlings should be moved into cooler environment.