





Plant Propagation PLS 3223/5222

Dr. Sandra Wilson
Dr. Mack Thetford



Techniques of Propagation by Seed

Chapter 8
S. Wilson



Chapter 8 Objectives are to Understand:

1.

- The major systems of seedling production

2.

- Mechanization methods used to facilitate planting

3.

- Methods used to maximize transplant production

Seedling Success

Proper
genetic
characteristics

Seed quality

Manipulation
of seed
dormancy

Proper
environment

Seed Propagation Systems

Field seeding



- seeds are planted at a relatively low density in location where plant is to remain

Field nurseries

- seeds are planted closely (high density) in a field and used for future transplanting at a wider spacing.

Protected conditions

- seeds are planted in flats in a greenhouse or similar structure prior to transplanting to a permanent location.

Maximizing Field-seeding Success:

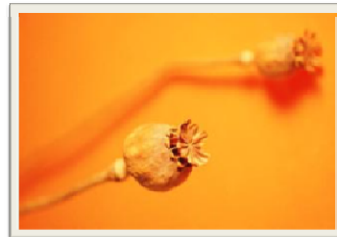
A proper seed bed	High quality seed	The correct planting time
Pre-treatments to facilitate sowing or to relieve dormancy		The proper mechanical seeder
The proper sowing rate	The proper post-sowing care	The proper sowing depth




Calculating the Rate of Seed Sowing

Weight of seeds to sow per unit area =

$$\frac{\text{Density (plants/unit area) desired}}{(\text{Purity \%}) \times (\text{Germ. \%}) \times (\text{F. factor}) \times (\text{Seed ct.})}$$



Maximizing Field Nursery Transplant Success:

1. • Site preparation
2. • Seed bed preparation
3. • Time of year for sowing
4. • Sowing rates
5. • Plant after-care
6. • Harvesting transplants



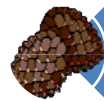
Seeding Times for Woody Seedling Production



Fall Seeding



Fall or Spring Seeding



Spring Seeding



Immediate Sowing



Field Nursery Coconut Seed (Westwinds Nursery, Palm City FL)



Maximizing Transplant Success Under Protected Conditions:

Germination facilities

Media

Mechanical seed sowing

Watering systems

Temperature control

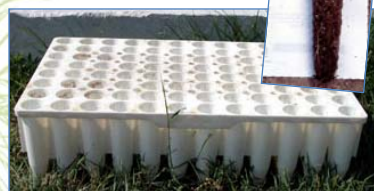
Transplanting

Seedling growth



Production Systems for Transplants

- ❖ Flat production
- ❖ Plug production
- ❖ Production of woody plant seedlings in containers



Advantages of Plug Production:

Optimizes plant number per unit of greenhouse space

Control of environmental conditions

Fast production, turn around time

Precise crop scheduling

Facilitated shipping

Easy, uniform transplanting



Plug and Pot Production, Prolific Plants, Apopka, FL



Plug Production, Knox Nursery



Hydroponic Lettuce Plug Production, Japan



Plug Growth Stages



Stage 1

- Radicle emergence



Stage 2

- Cotyledon spread



Stage 3

- Unfolding of 3-4 leaves



Stage 4

- More than 4 leaves



Achieving Uniformity



Automated Plug Production

Mixing soil

Harvesting,
sorting and
coating seeds

Packaging

Seeding



Transplanting

Irrigating/
fertigating

Environmental
control

Labeling/
shipping



Automation



Automated Plug Production, Knox Nursery, FL



Automated Plug Transplanting, Hines Nursery, TX



Automated Linger Production, Hatchett Creek Nursery, FL



Mechanization-Holland



Mechanization-Holland



Seeders for Plug Growers



Template

- least expensive



Needle

- fully mechanical;
- 100,000 seeds/hr



Drum

- fastest, most precise,
- most expensive;
- 800,000 seeds/hr

Moisture

❖ The moisture content of the growing medium can be critical to germination success.

Wet medium

- Coleus, Begonia, Alyssum

Moist medium

- Impatiens, Petunia, Pansy

Drier medium

- Asters, Verbena, Zinnia



Specialized Germinators



Bottom Heat

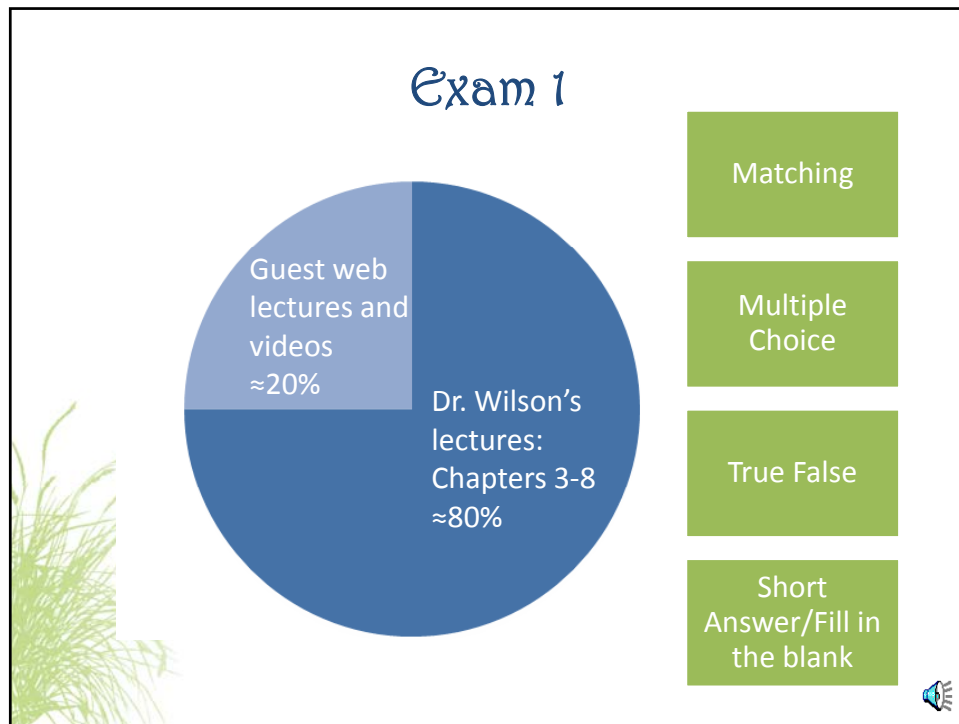
Three common temperature regimes:

- 26-30°C (78-80°F)
- 21-22°C (70-72°F)
- 18-19°C (64-66°F)



Shipping





Tips for Studying

- Review your lecture notes
- Review relevant portions from your text
- Review study guides for web lectures, watch videos
- Review quiz 2
- Email, call or stop by my office anytime if you have any questions

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