Module 5: Germination and Dormancy
• **GSPC Target 8** ‘20% of threatened species to be available for recovery and restoration programmes’

• Linking *in situ* and *ex situ* conservation

• Using collections for restoration activities
Conserving quality collections

Collection in the wild ➔ Cleaning and drying ➔ Storage and longevity ➔ Germination and dormancy ➔ Restoration ➔ Collection in the wild
Xishuangbanna Tropical Botanical Garden, South Yunnan, China
- Restoring remnants of tropical forest
- Cleared for rubber plantations
- Using historical records to determine what has been lost
Germination requirements are species-specific

Consider

- Taxonomy
- Life cycle of the plant
- Dormancy

- Habitat
- Climate
If information is not present for the species of interest find the most closely related species.
Habitat type

Aquatic

Dune

Temperate Forest

Tropical forest

Grassland
Life Cycle

Books

Journal Papers

Seed Dormancy and Germination of the European Chaerophyllum temulum (Apiaceae), a Medicinal Plant

Seed dormancy and germination in three Crocus species (Iridaceae): implications for evolution of dormancy within the genus

Seed dormancy and germination of the three tropical medicinal species Gomphandra luzoniensis (Stemonuraceae), Nothapodytes nimmoniana (Icacinaceae) and Goniothalamus amoyin (Annonesaceae)

Growing Native Seeds for Restoration: Seed Dormancy and Germination of Sidalcea malviflora ssp. virgata (Malvaceae)

Efecto de diferentes métodos de escarificación sobre la germinación de las semillas de Cenchrus ciliaris cv. Biloela

Resumen: En un diseño de bloques al azar con 8 repeticiones se estudió el efecto de diferentes tratamientos sobre la germinación de las semillas de Cenchrus ciliaris cv. Biloela. Los tratamientos fueron: SO 4 H2 (24 N) durante 8, 12, 16, 20 y 30 minutos, NO 3 K (0, 2%) ...

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Life Cycle

- What is the life cycle in the natural habitat?

Diagram:
- The plant grows
- The plant flowers
- The fruit releases seeds
- The plant produces fruit
- The plant dies
- The seed germinates

When does this occur?
What is the life cycle in the natural habitat?

- The plant flowers
- The fruit releases seeds
- The plant produces fruit
- The plant grows
- The seed germinates
- What are the environmental conditions when this occurs

What are the environmental conditions when this occurs

The plant dies
# Climate

## Seed dispersal

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<thead>
<tr>
<th>Accession</th>
<th>Family</th>
<th>Species</th>
<th>Collector</th>
<th>Collector N</th>
<th>Collection date</th>
<th>Country</th>
<th>Latitude</th>
<th>Longitude</th>
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**Max**

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**Average**

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eg. Temperate regions summer annuals

Seeds germinate

Seeds dispersed
• Evolved to delay germination until favourable environmental conditions are present for survival.
<table>
<thead>
<tr>
<th>Physical dormancy</th>
<th>Dormancy breaking in the wild</th>
<th>Dormancy breaking in the lab</th>
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<tbody>
<tr>
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<td>Hard seed coat. Fire stimulated high temperatures crack the seed coat</td>
<td>Scarify seeds to allow imbibition of water</td>
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<tr>
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<td>Animal dispersed-digestive tract breaks physical dormancy</td>
<td>Sulphuric acid used to break dormancy</td>
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</table>
Endogenous (internal) dormancy

Morphological dormancy

Dormancy breaking in the wild
Embryo underdeveloped. needs to grow before germination occurs

Dormancy breaking in the lab
Cold or warm stratification

Cold or warm stratification - Move along experiment

Seed dispersal

16 15 13 J F M 9 6 A N 4 3 J J 0 12 O N 14 D

15 30 26 22 M A N 22 14 J A S 22 26 29 O N D

20/10C 15/5C 20/10C
Dormancy – Plant orders
Germination in the wild and the lab

Taxonomy - *Nymphaeae caerulea*.

Habitat - Aquatic. Germination occurs in water

Climate - Distribution. East Africa rivers, Nile. Warm water

Dormancy - Physical dormancy. To break seed coat needs scarification
Germination - Ex situ

Physical dormancy – Scarification of seed coat

Allows water in and germination takes place

Germination takes place in water
End of Module Five (Germination and Dormancy)

Go to Module Six (Data Management)
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