

HOS 4341

Dormancy

Dormancy

Overview

- **Perennials**
- **Seed dormancy**

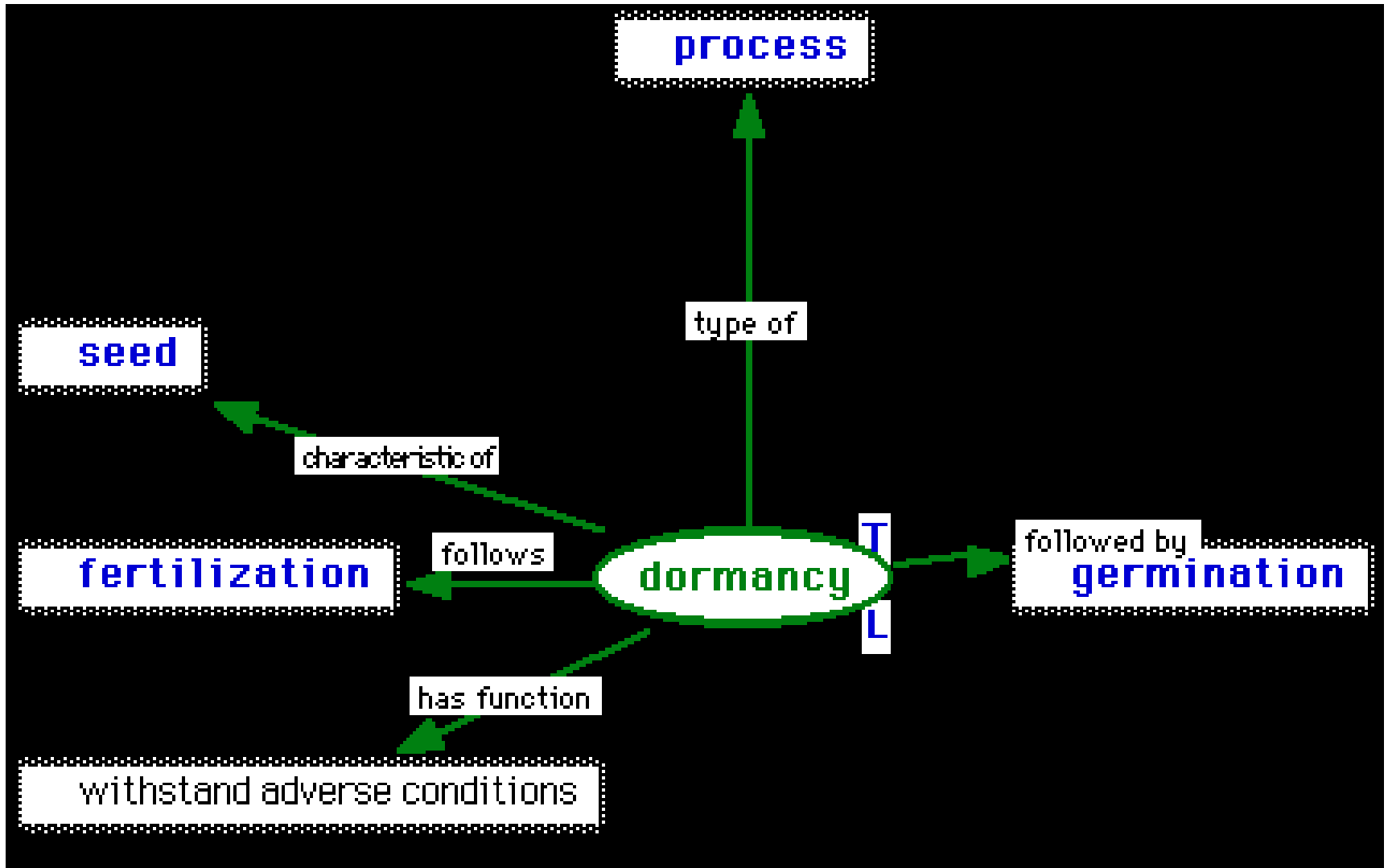
Release of Dormancy

- **Chilling requirement**
- **Heat unit requirement**

Mechanism of Onset and Release of Dormancy

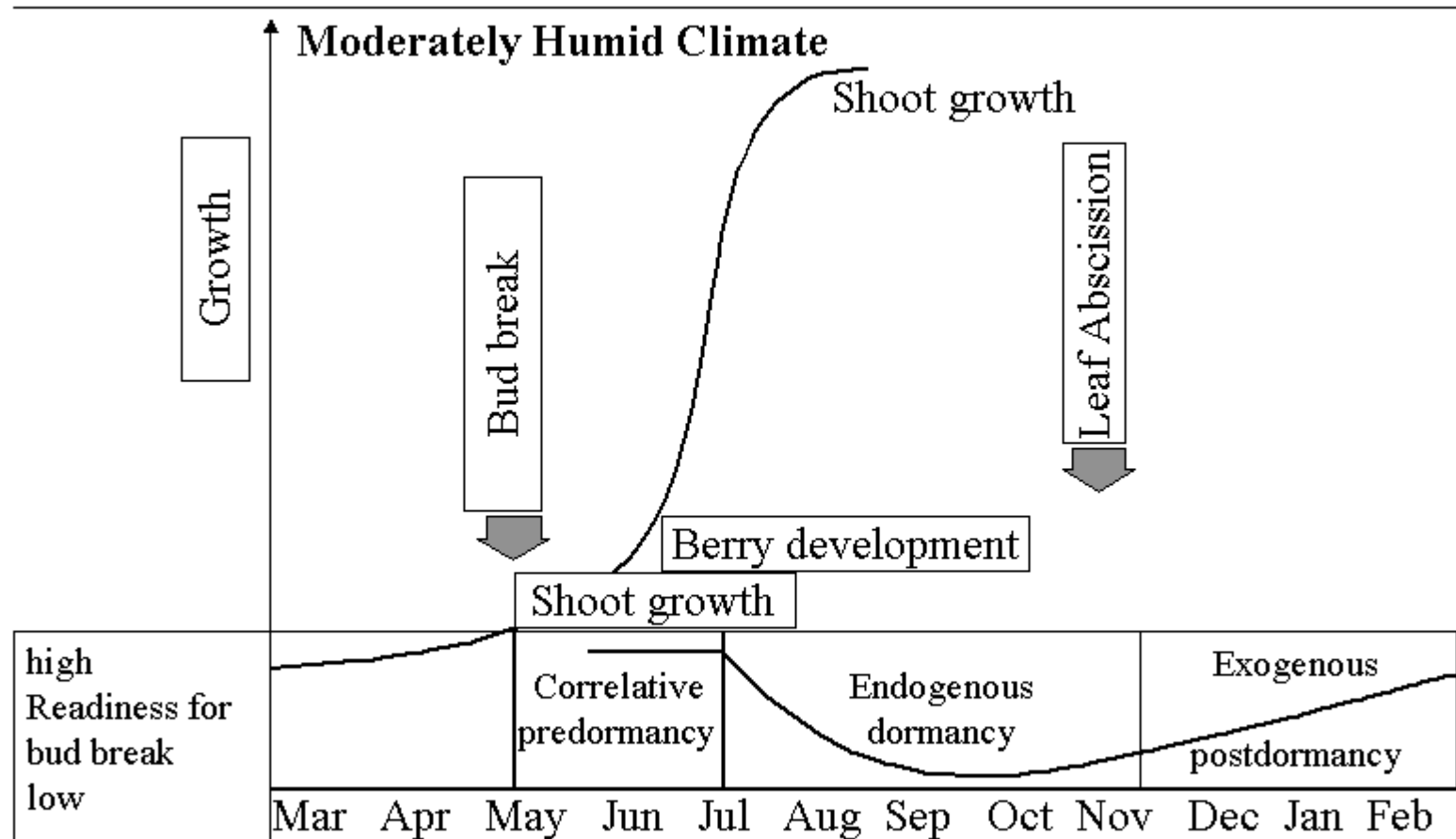
- **Hormonal**
- **Nutritional**
- **Gene expression**

Position of dormancy in a plant's life cycle



Dormancy in Annuals

Annual Rhythm of Growth & Dormancy



Dormancy

Paradormancy

Endodormancy

Ecodormancy

Regulated by physiological factors outside affected structure

Regulated by physiological factors inside affected structure

Regulated by environmental factors

Apical dominance

Chilling responses

Temperature extremes

Photoperiodic responses

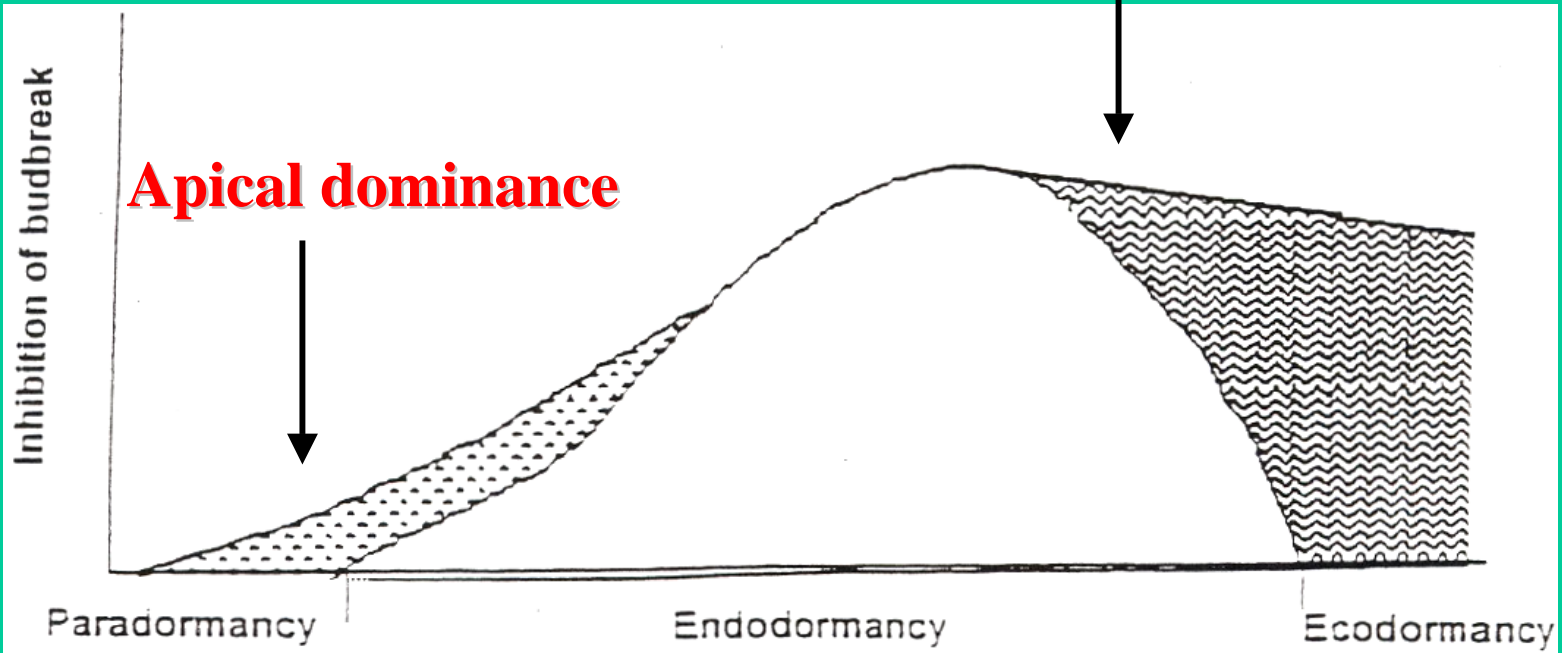
Photoperiodic responses

Nutrient deficiency

Water stress

- **Photoperiodic responses perceived by light. If the leaves are removed, dormancy is lost**
- **Remove apical bud**

- **Photoperiodic responses perceived by the bud**
- **Lower temperatures sensed by the bud**



A schematic representation of inhibition of budbreak during dormancy. Dormancy begins with paradormancy and it deepens during endodormancy. The depth and duration of ecodormancy is environment dependent.

Environment dependent

Dormancy and cold acclimation

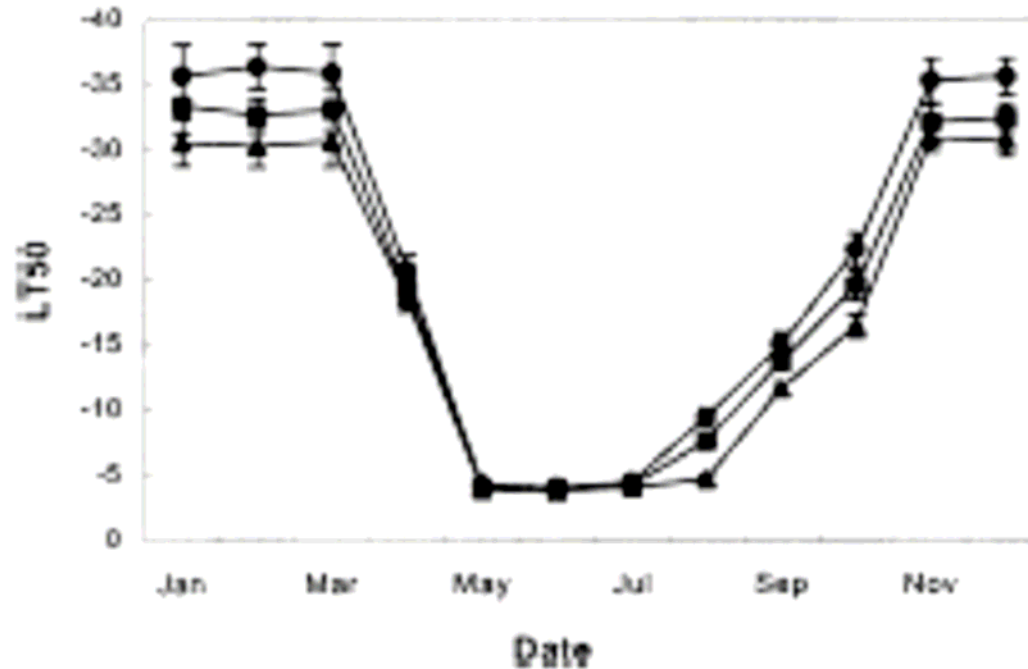


Fig. 4 Seasonal changes in freezing tolerance (LT_{50} , °C) of the lateral buds in 3-year-old field-grown seedlings of three ecotypes of *B. pendula* (triangle the southern ecotype, square the central ecotype, circle the northern ecotype) from January to December. Values are the means \pm SE of 5 replicates

Dormancy Intensity

Measured as days to 50% bud break

Cultural manipulations require identification of the correct stage of bud in dormancy cycle

Will aid in chemical applications

Use of Markers

Morphology - Shape or Size

Anatomy - Arrangement of bud tissues

Biochemistry - Pigmentation

Molecular - Expression of certain genes



Lateral dormant bud

Dormancy

- **Suspension of visible growth of any plant structure containing a meristem**
- **Biological development continues**
- **Enables perennials to withstand environmental stress**
- **Perennials begin to develop cold hardiness in late summer and fall - Acclimation**
- **Dormancy is a prerequisite for development of cold hardiness**

Questions ??

Define dormancy?

Why do acclimation and dormancy develop in parallel?

What is the most important causative agent of dormancy?

Suggest ways to determine the stage of dormancy in a bud?



Artist's view of dormancy



Dormancy induction

Dormancy release

Germination

