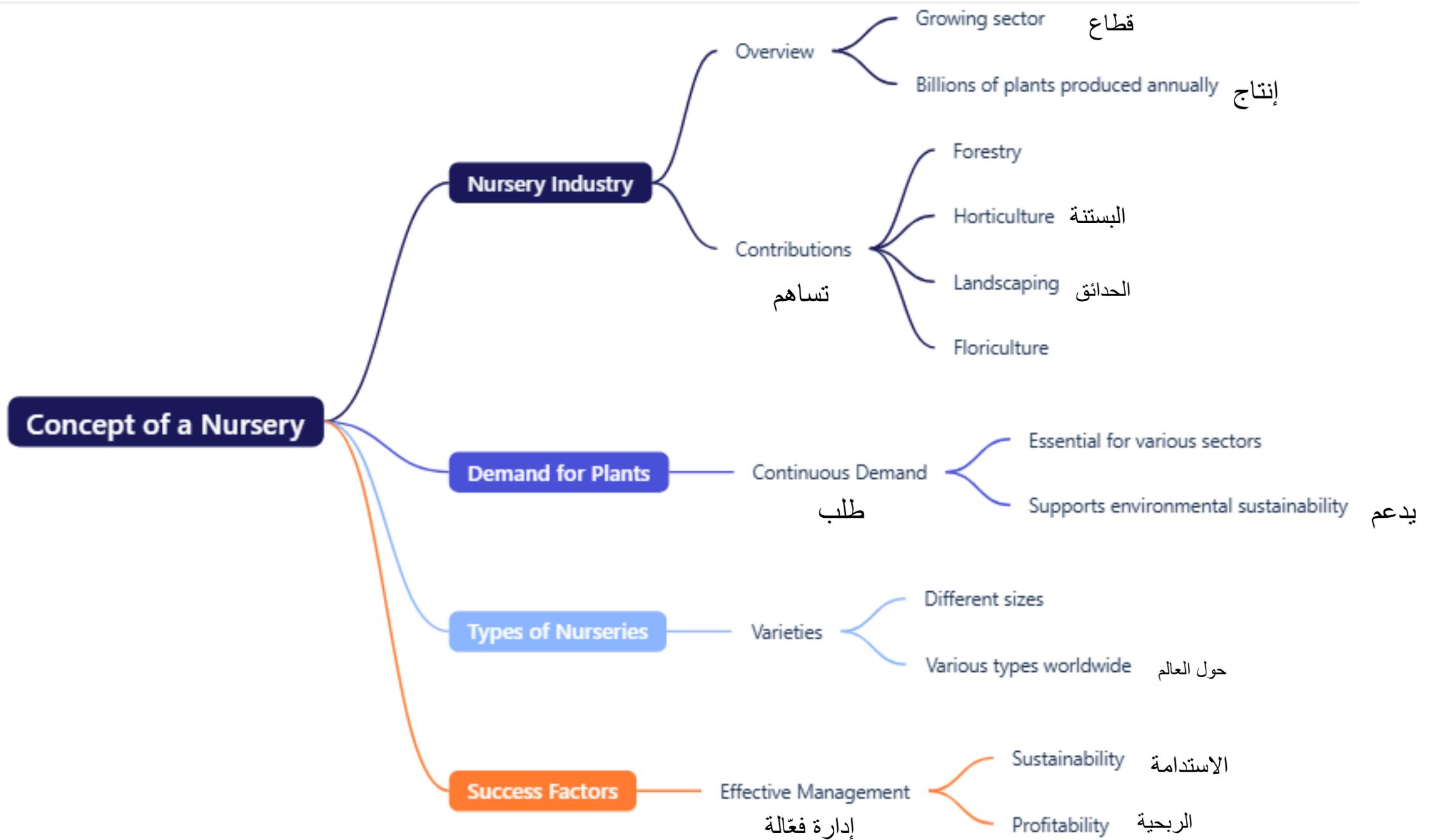
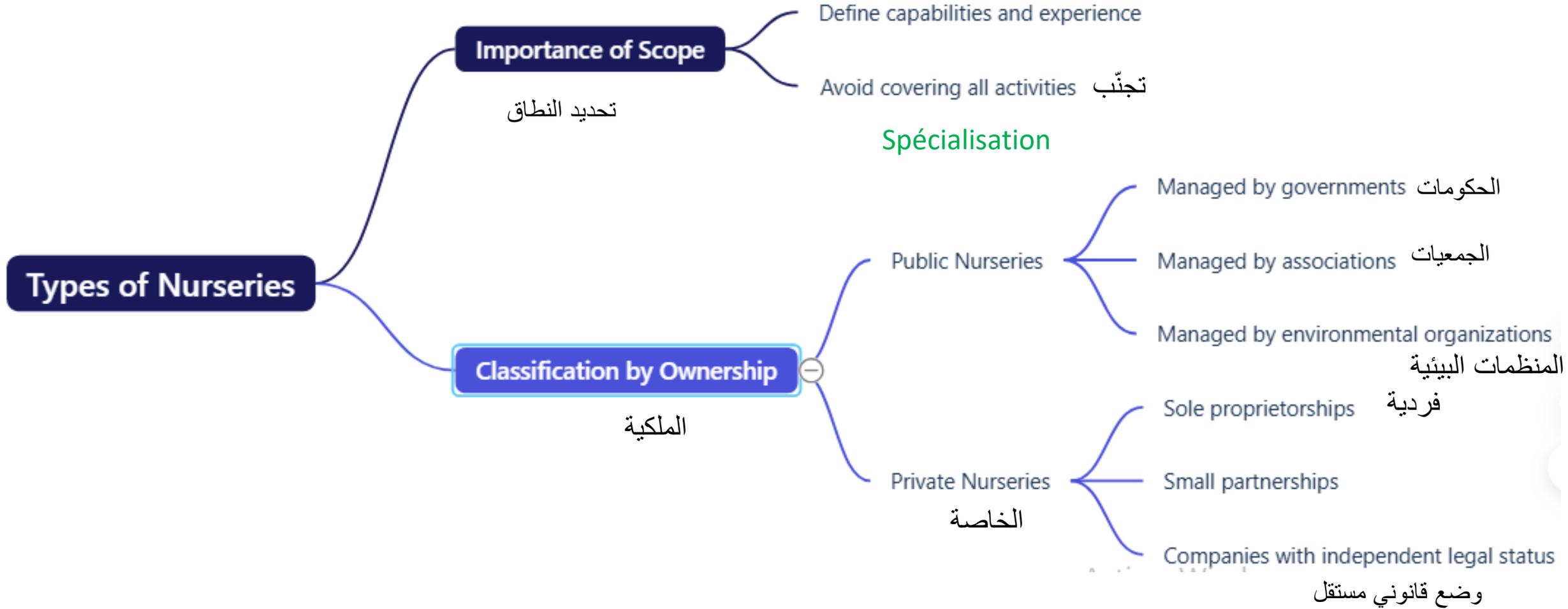


Matière 3 Cultures maraichères

Chapter 1 Production of seedlings in nurseries







Nurseries Classification

Type of Plants Produced

- Native Plants المحلية
- Ornamental Plants الزينة
- Seedlings
- Bonsai
- Bulbs

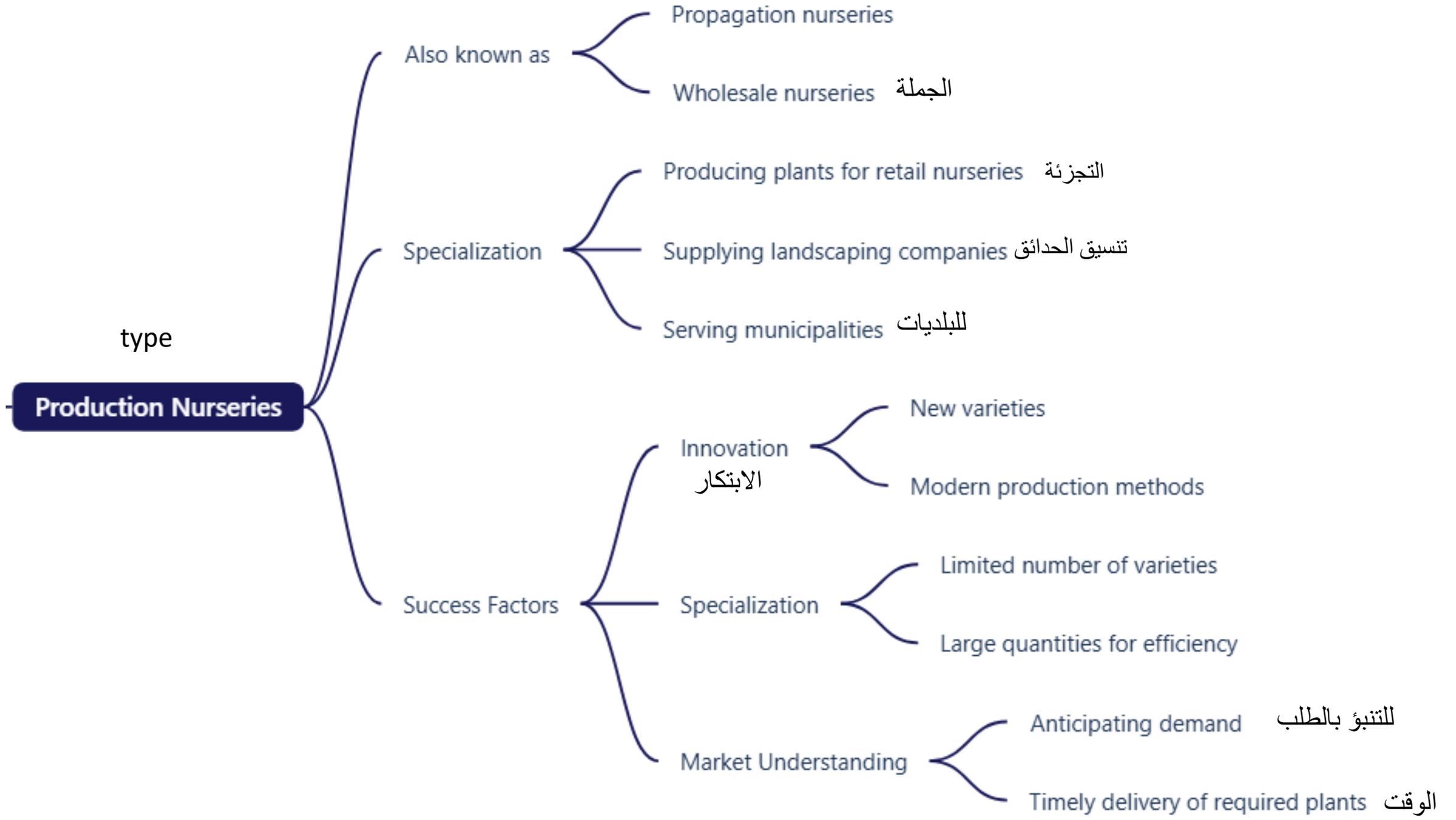
Production Method

- In the Ground
- In Containers

Size of Plants Produced

- Small Seedlings
- Small Containers
- Mature Plants







Type

Growing-on Nurseries



Function

Purchase small seedlings from production nurseries

Transplant into larger containers

Care for plants to increase value العناية

تركز
Focus

Healthy and vigorous growth

Cleanliness of containers

Freedom from weeds تخلص من الأعشاب

Appropriate labeling and supports

الدعامات

الوسم المناسب



Retail Nurseries

Definition

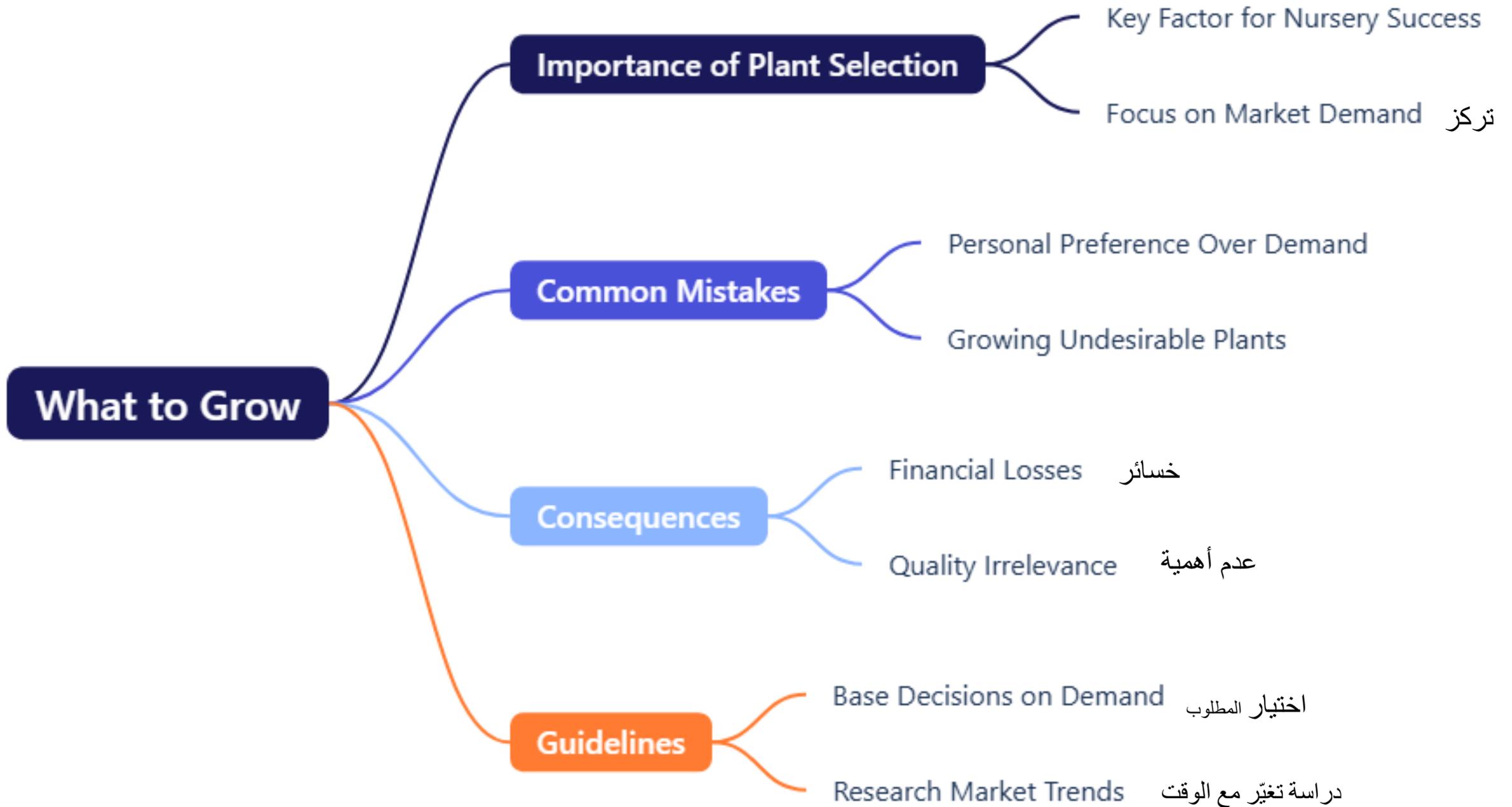
- Purchase plants from production nurseries شراء
- Sell directly to consumers

Products

- Plants
 - Seedlings
 - Bulbs
 - Potted plants
 - Bare-root plants جذور عارية



- Garden Supplies
 - Pots
 - Fertilizers
 - Soil
 - Pesticides



The characteristics of the plants must also be taken into account, such as:

- The space they need (climbing or creeping plants require more space than slender trees).
- Growth rate (fast-growing plants must be sold quickly, while slow-growing plants can be kept for longer).
- The possibility of repotting into larger containers when necessary.
- The most important categories of plants produced in nurseries are:
 - Trees and shrubs (native or exotic, fruit-bearing or ornamental, climbing or ground cover).
 - Seasonal flowers and greens.
 - Ornamental plants grown in containers.



Characteristics of Plants

Space Requirements

المطلوبة

- المتسلقة
Climbing Plants
- الزاحفة
Creeping Plants
- أشجار نحيلة
Slender Trees

Growth Rate

معدل النمو

- Fast-growing Plants
- Slow-growing Plants

Repotting

Larger Containers





Plants

Foliage and Indoor Plants

Houseplants

Hanging Baskets

Palms

Ferns

Medicinal and Aromatic Herbs

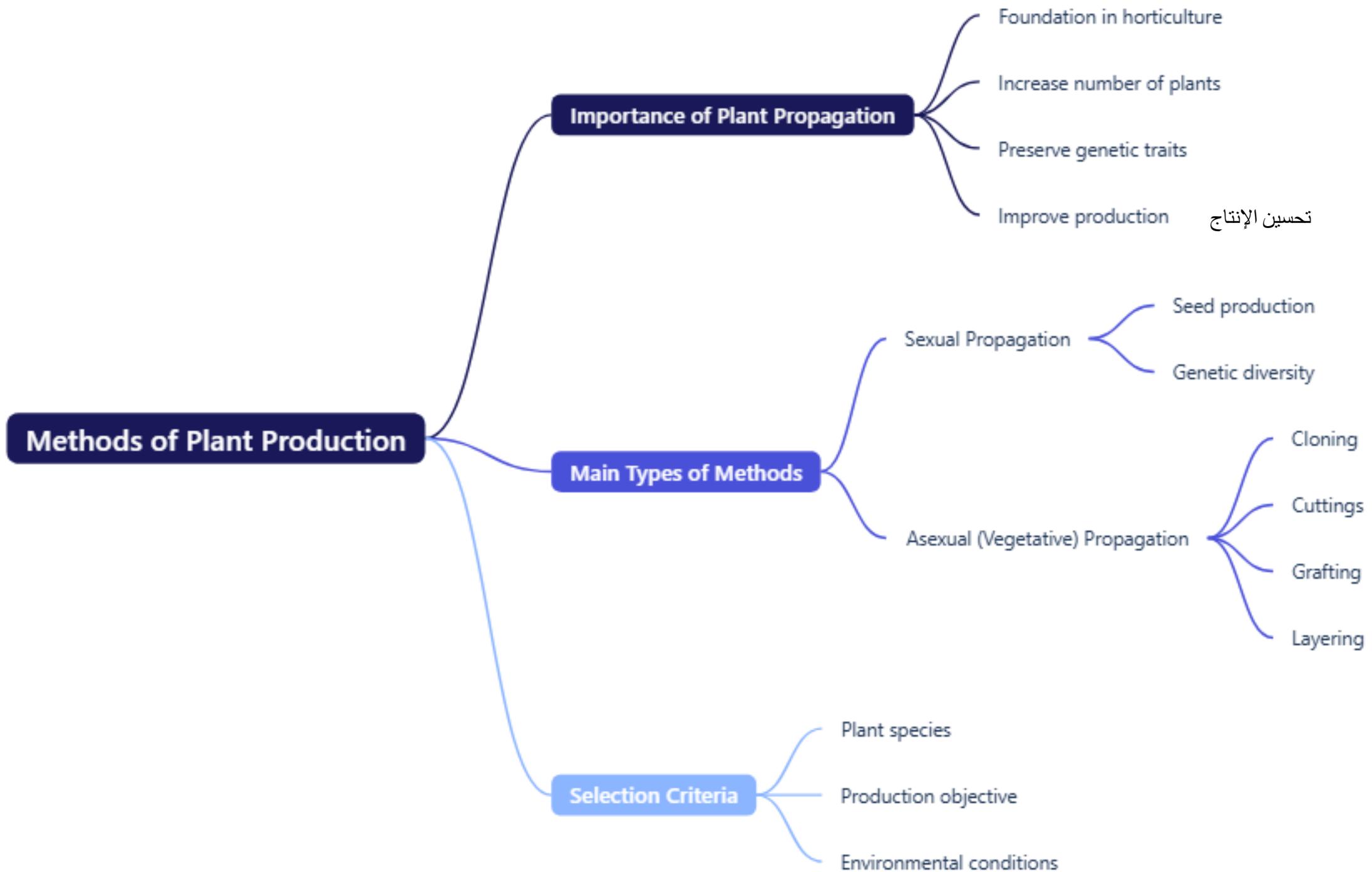
Perennials and Traditional Garden Plants

Bulbs and Tubers

Aquatic Plants

Bonsai





Sexual Methods of Producing Plants

Definition

- Producing plants from seeds
- Involves pollination and fertilisation

Advantages

- Genetic Diversity
 - Important for plant breeding التربية
 - Development of new varieties
- Cost and Ease
 - Low cost التكلفة
 - Easy to apply

Disadvantages

- Growth Time
 - Longer to reach flowering stage
 - Longer to reach fruiting stage
- Variability
 - Plants may not be identical to parent
 - Variation in characteristics

Asexual (Vegetative) Methods of Plant Production

Definition

- Propagation without pollination or fertilization
- New plants from vegetative parts

Plant Sources

- Stems
- Roots
- Leaves

Characteristics

- Genetically identical to parent
- Preserve desirable traits السمات المرغوبة

Applications

- Widely used in commercial nurseries
- Accelerate production



Propagation by Cuttings

Definition

Involves plant parts

- Stem cuttings
- Leaf cuttings
- Root cuttings

Methodology

Suitable medium

Encourages root formation

Benefits

- Simplicity
- Low cost

Applications

- Ornamental plants زينة
- Fruit plants
- Shade plants نباتات الظل





Layering

Propagation Technique - Simple Layering

Definition

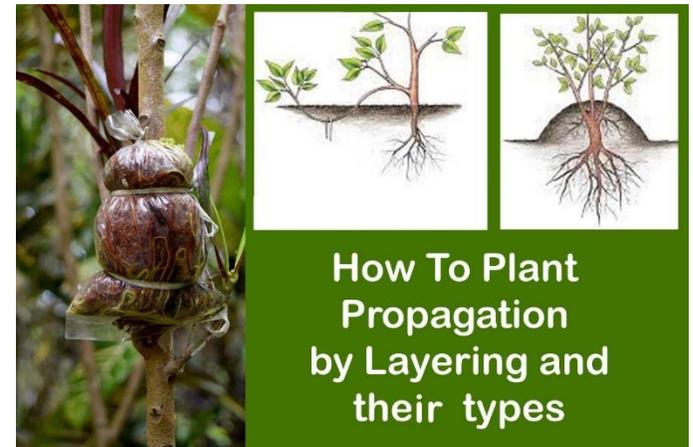
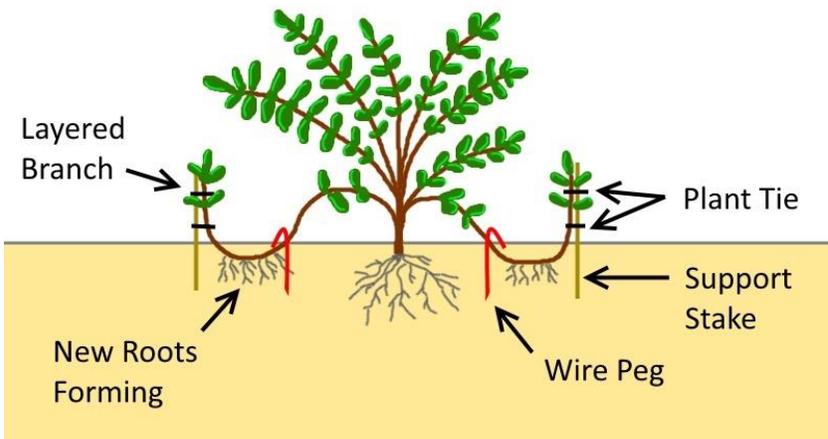
- Bending a branch of the parent plant
- Partially burying in soil
- Roots form and branch separated

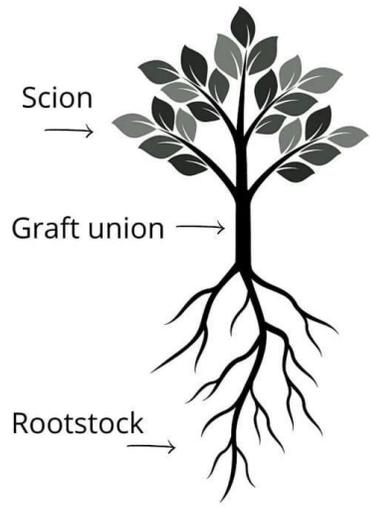
Purpose

- Independent plant creation
- Method for difficult-to-propagate plants

Applications

- Trees
- Shrubs





Propagation by Grafting

Definition

- Attaching scion to rootstock
- Combining desirable traits

Purpose

هدف

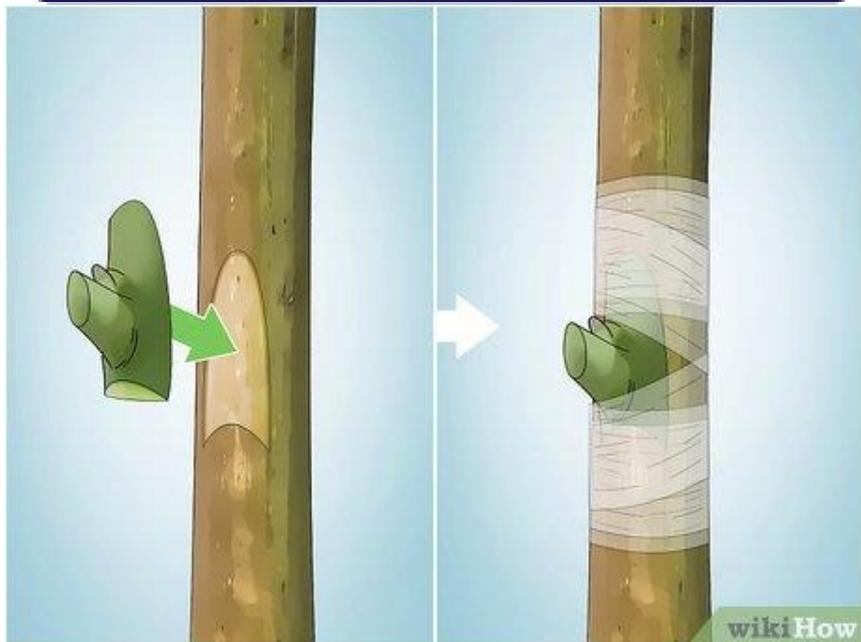
- Improve disease resistance
- Enhance growth strength قوة النمو

Application

- Widely used in fruit trees
 - Increase production
 - Improve fruit quality



Propagation by Budding



Definition

Special type of grafting

Involves inserting a single bud

Method

Bud inserted under bark

Utilizes rootstock

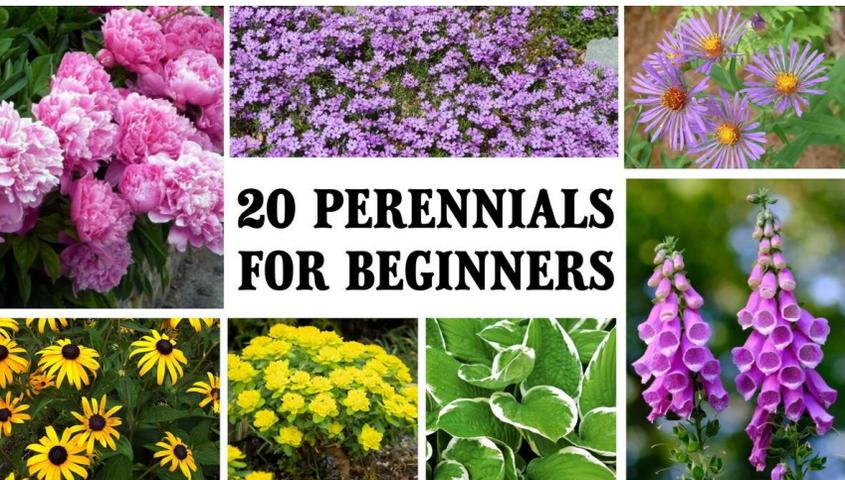
Advantages

Economical in plant material

Quick results

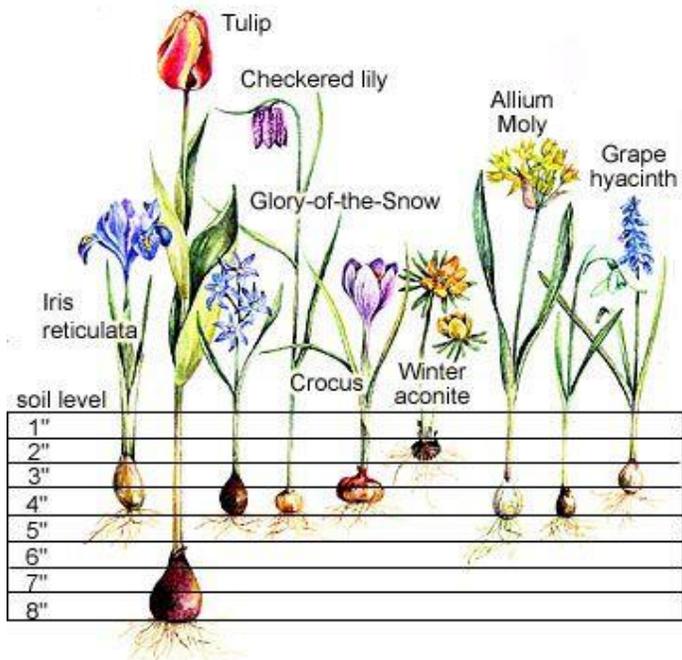
Applications

Many horticultural plants



20 PERENNIALS FOR BEGINNERS

Propagation by Division



Definition

- Method of dividing parent plant
- Each part contains roots and buds

Characteristics

Perennial plants

Examples

- Hostas
- Daylilies
- Peonies

Herbaceous plants

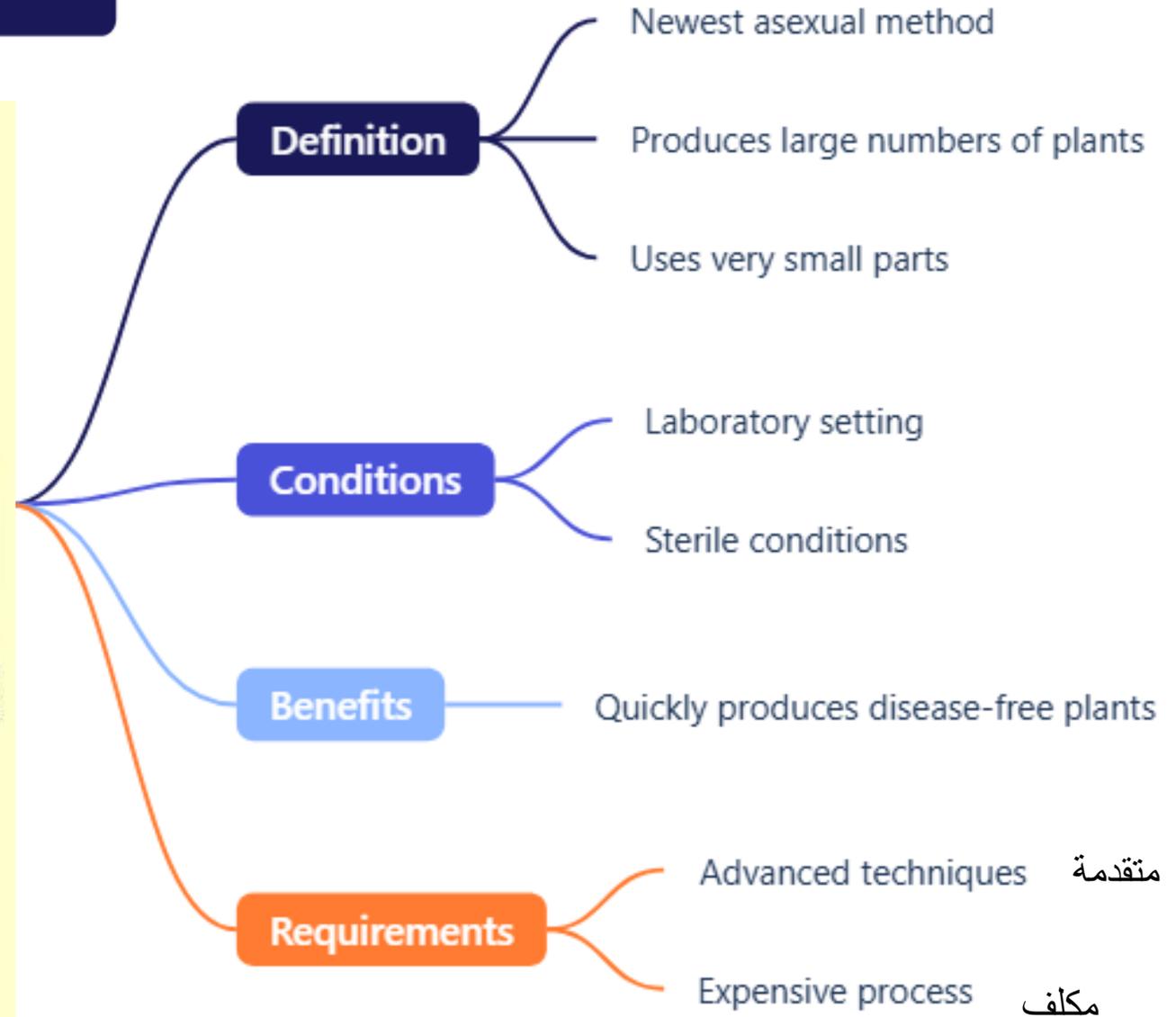
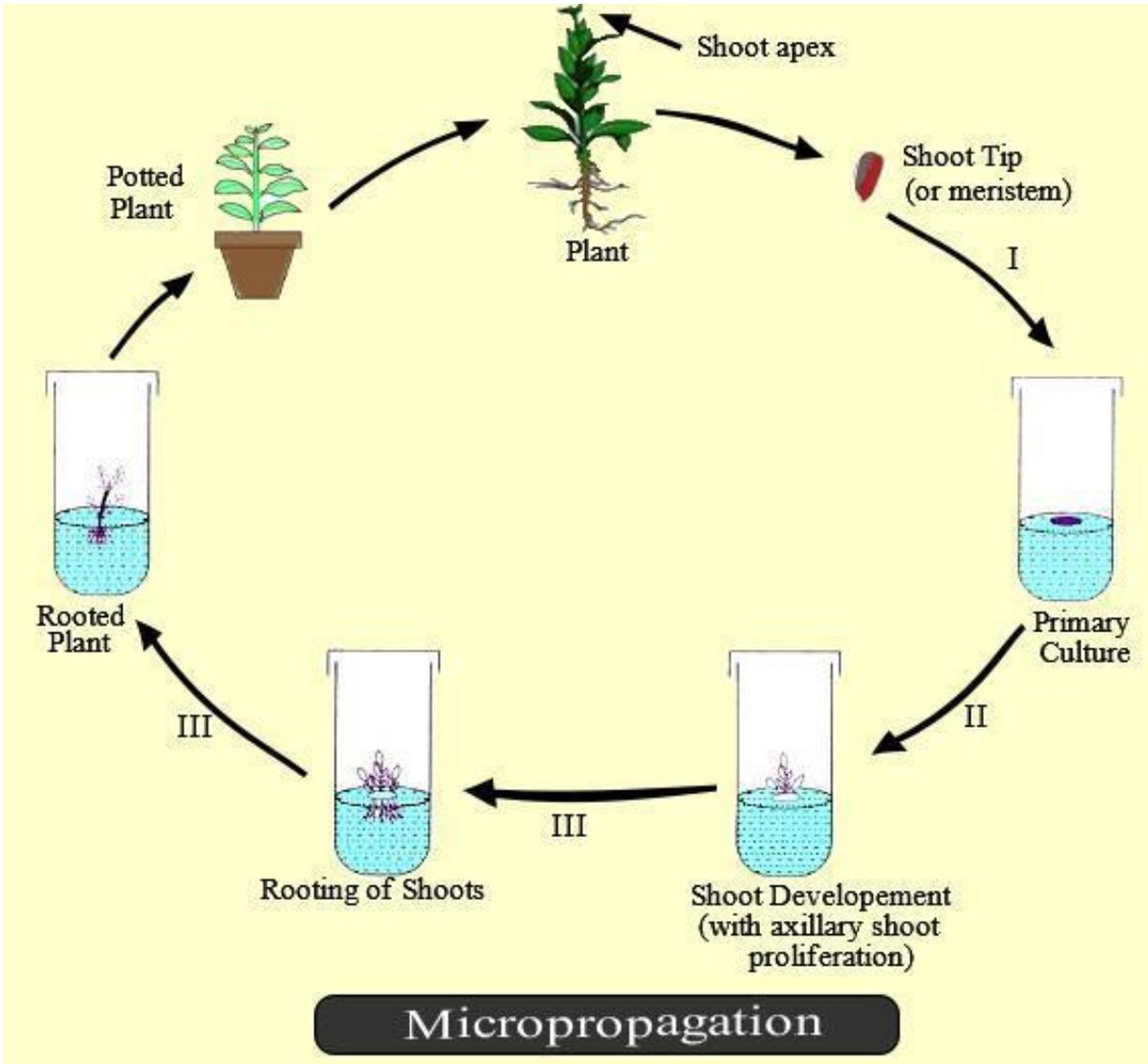
Examples

- Marigolds
- Zinnias
- Astilbe
- Sedum

Advantages

- Quick
- Simple

Propagation by Tissue Culture (Micropropagation)



3

إنتاج المجموعات النباتية

Techniques for Producing Clumps

Importance of Clump Production

Asexual propagation method

Genetic uniformity

Plant Parts Used

Side Shoots

Side Buds

Bulbs

Corms

Root Crowns

Benefits

Genetically identical plants

Enhanced growth from strong parent plants

Rhizome



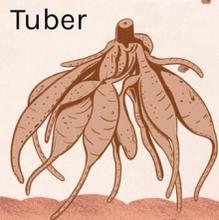
Corm



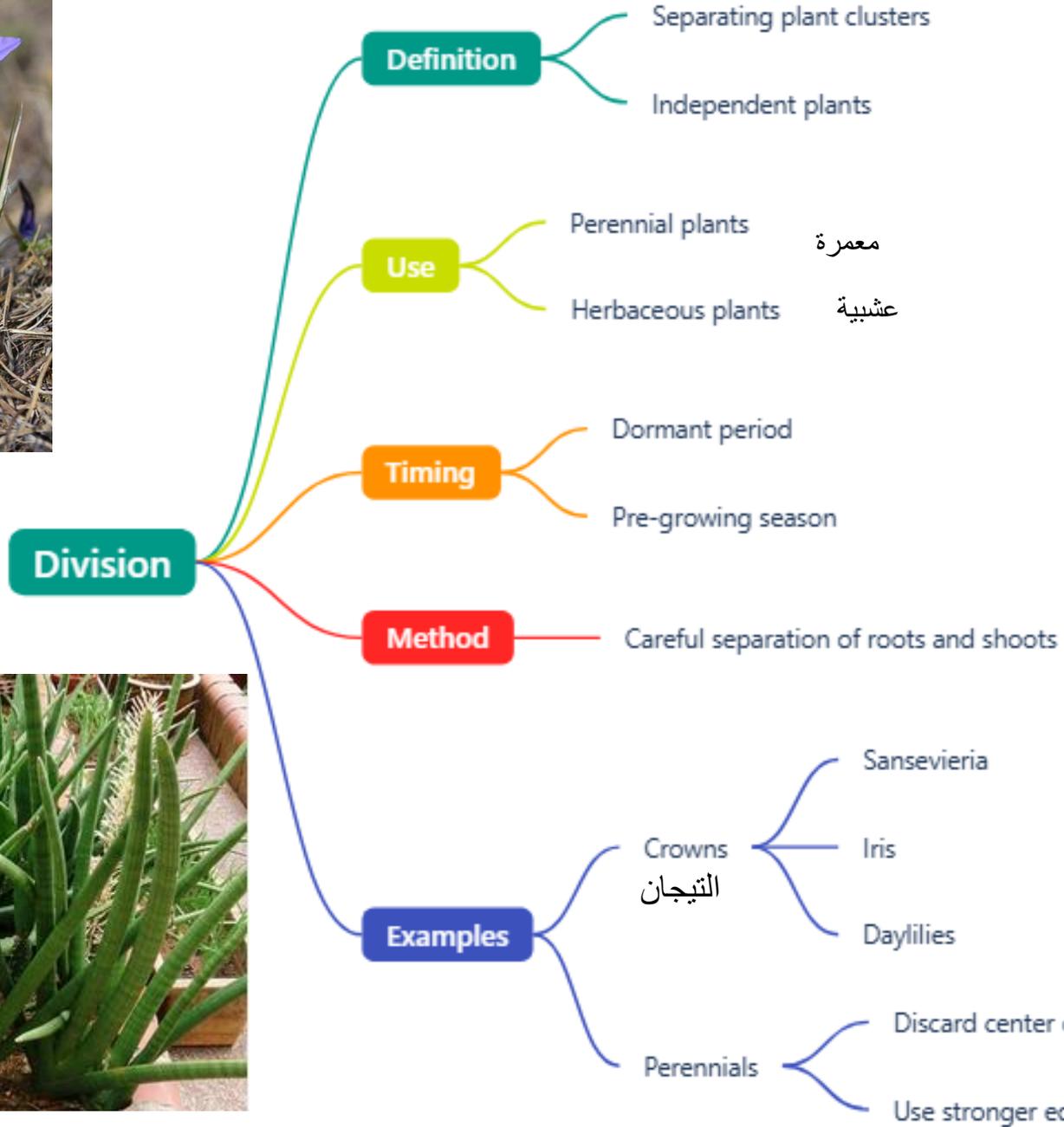
Bulb

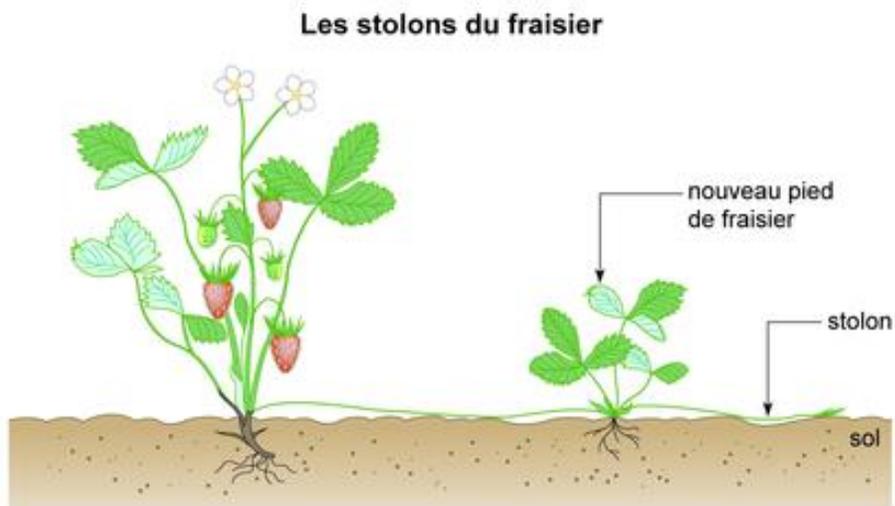


Tuber



Corms, Bulbs, Tubers, and Rhizomes





Stolons and Runners

Definition

- Horizontal stems on soil surface
- Form new plants at ground contact

Plantlets

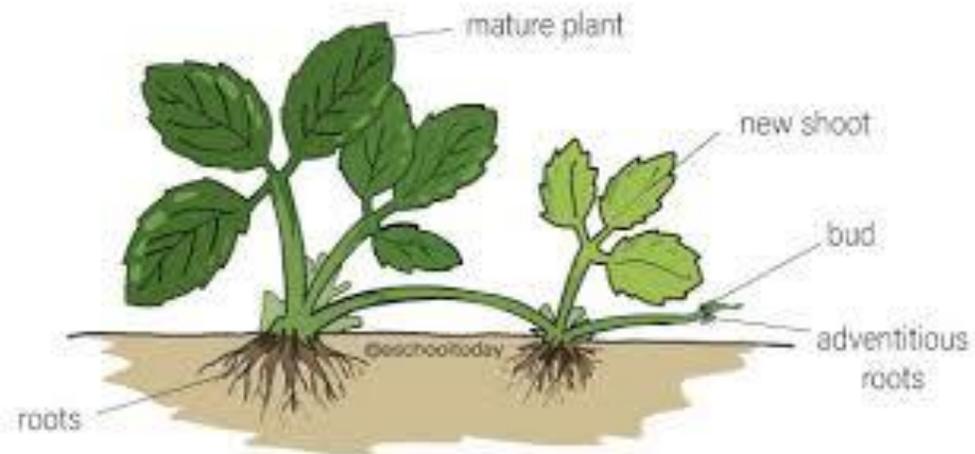
- Develop roots
- Can be separated or retained

Planting Options

- Separate once rooted
- اتركها ملتصقة حتى تصبح جاهزة
- Leave attached until ready

Examples

- Strawberry
- Spider plant





Offsets (Basal Shoots/Seedlings)



Definition

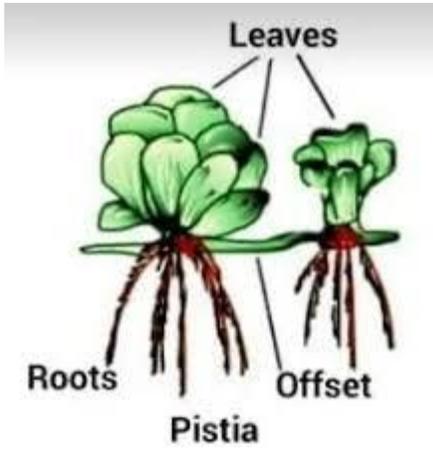
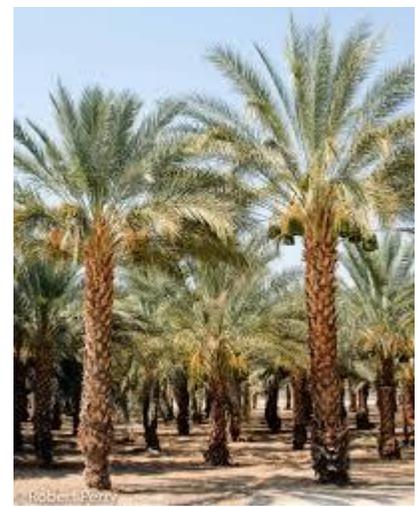
- Small seedlings or shoots
- Produced around base of parent plant

Separation

- When to separate — After roots develop slightly
- Method — Plant independently

Examples

- Date Palm
- Haworthia
- Bromeliads
- Cacti
- Succulents — Many species produce offsets





Separating Bulbs and Rhizomes

Overview

- Division of clumps from original plants
- Increases number of plants



Bulbs

Examples:

- Tulips
- Daffodils
- Hyacinths
- Lilies



Key Points:

- Produce new bulbs next to original
- Separate every few years
- Improves flowering and plant quality



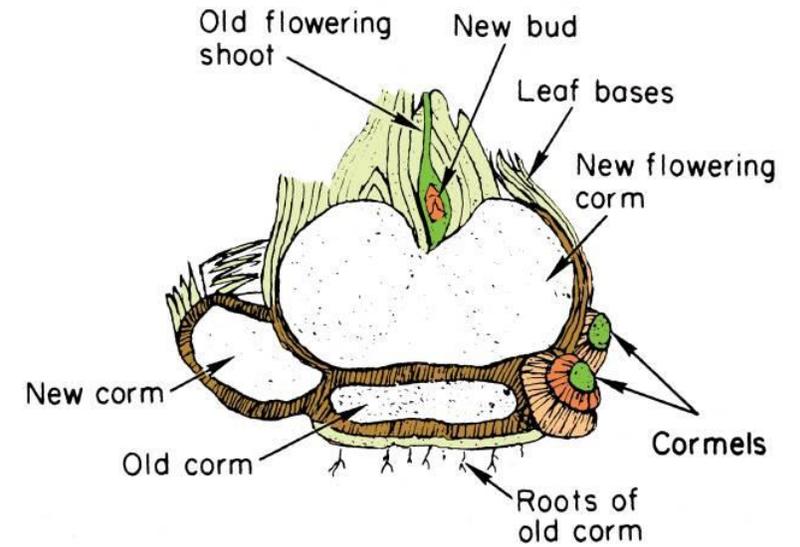


Types of Plants

Crocuses

Gladioli

Freesias



Corms

Corm Structure

Main Corm

Cormlets

Form around large corm



Growth Process

Period of Growth

Separation of Cormlets



Tuber

Definition

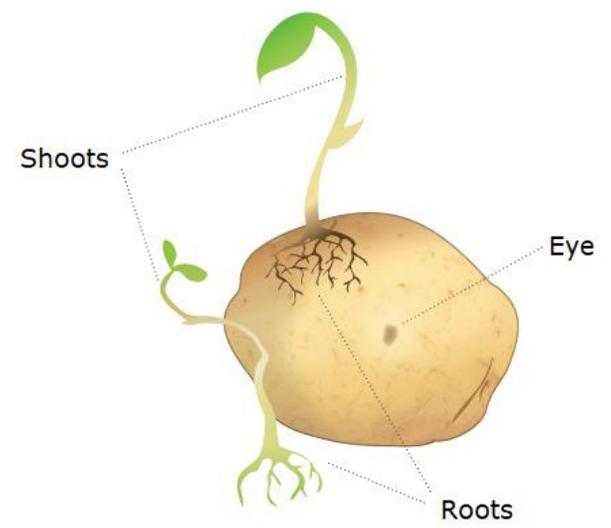
- Part of plant's stem
- Stores food as starch

Reproduction

- Asexual reproduction
- Genetically identical plants
- Common in specific plants

Importance of Tuber Propagation

- Produces genetically identical plants
- Survival in difficult conditions



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Example: Potatoes



4

The Growing Medium

Definition

- Material for plant roots
- Extracts water and nutrients

Importance

- Crucial for nursery management
- Essential for healthy plant growth
- Particularly important in controlled environments

Applications

- Containers
- Greenhouses

Types of Growing Media

Soil-based media

Main component — Natural soil

Organic media

Common in nurseries

Based on organic materials

Peat الخث

Coconut coir

Compost

Inorganic components

Added to improve properties



Functions and Importance of the Growing Medium

Physical Support

Provides root stability

Keeps plant upright استقامة

Must be lightweight and strong خفيف الوزن

Aeration

Roots need oxygen

Allows gas exchange

Air spaces in the medium

Oxygen

Carbon dioxide

Water Retention

Absorbs and retains water

Micropores for water retention

Macropores for drainage تصريف

Nutrient Retention

Retains essential nutrients

Cation exchange capacity (CEC)

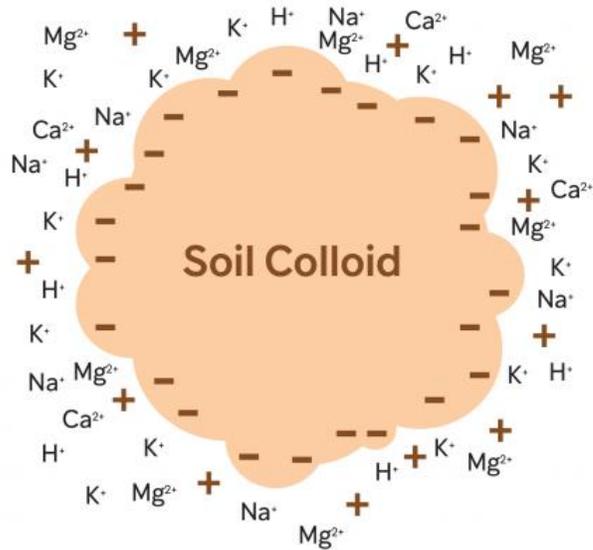
Indicator of medium quality

Cation Exchange Capacity is the **ability of soil to hold and exchange positively charged nutrients (cations)** with plant roots.

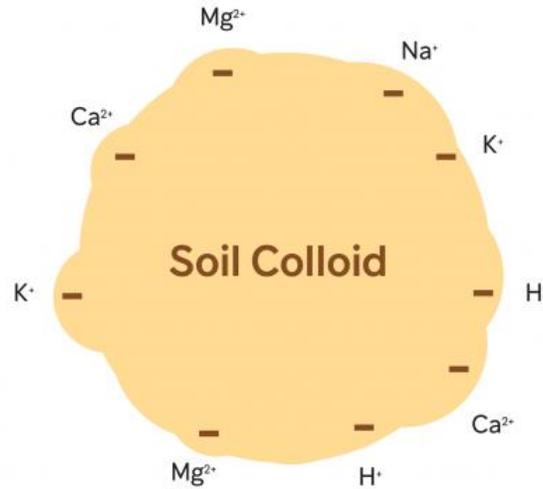
Soil Cation Exchange Capacity (CEC)



HIGH CEC SOIL

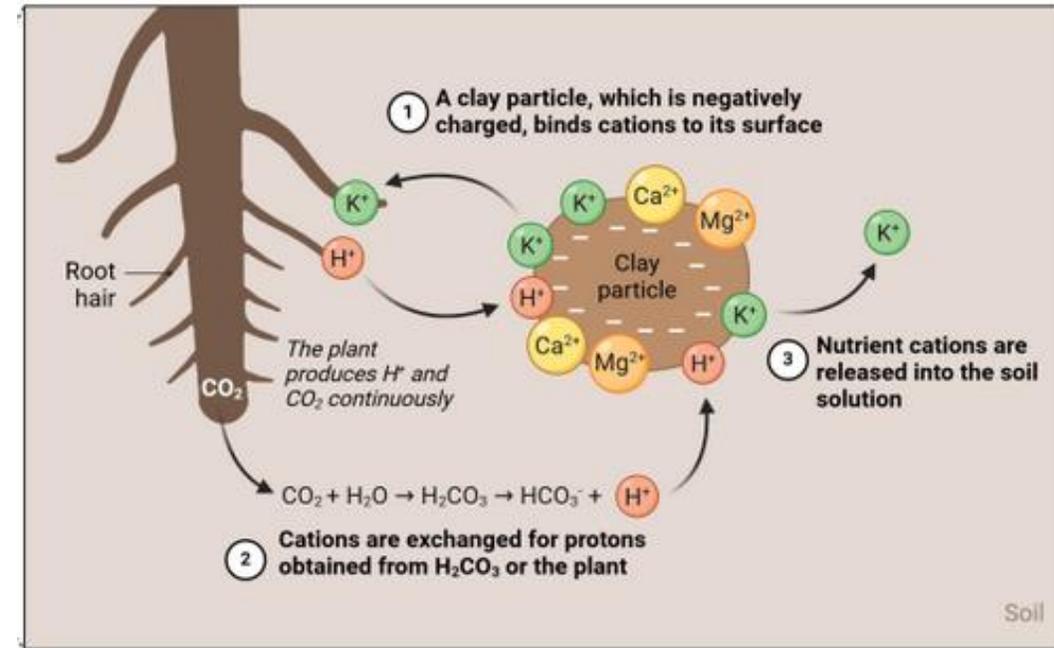


LOW CEC SOIL



- Has many negatively charged sites (-)
- Attracts and holds more nutrient cations
- The soil can store and supply nutrients efficiently

- Has fewer negatively charged sites
- The soil has limited ability to retain nutrients
- Nutrient cations lost due to leaching



Properties of the Medium

Physical Properties

Water Retention Capacity — Ability to retain water for plants

Porosity — Balance of air and water in medium

Bulk Density

Weight per unit volume

Should be light and easy to handle

Dense enough to support plants

Chemical and Biological Properties

pH — Affects nutrient availability

CEC (Cation Exchange Capacity) — Ability to retain and supply nutrients

Biological Aspect

Presence of beneficial or harmful microbes

Treatment to ensure pathogen-free medium

How pH Affects Nutrients

1. Neutral to Slightly Acidic pH (6 – 7)

Optimal range for most plants

Highest availability of macronutrients:

++++

Nitrogen (N)

Phosphorus (P)

Potassium (K)

Micronutrients (Fe, Mn, Zn, Cu) available in balance

Excellent absorption by plants

متاحة بشكل متوازن

How pH Affects Nutrients

2. Acidic Soil (pH < 5.5)

Increased availability of:

++++

Iron (Fe)

Manganese (Mn)

Zinc (Zn)

Copper (Cu)

Decreased availability of:

Phosphorus (P)

Calcium (Ca)

Magnesium (Mg)

Risks:

Aluminum (Al) and manganese toxicity

Poor root growth ضعف

How pH Affects Nutrients

3. Alkaline Soil (pH > 7.5)

Decreased availability of:

-

Iron (Fe) → leaf yellowing

Zinc (Zn)

Manganese (Mn)

Copper (Cu)

Phosphorus (P)

Relatively Available:



Calcium (Ca)

Magnesium (Mg)

Common Issues:

مشاكل شائعة

Micronutrient deficiency despite presence in soil

نقص العناصر الصغرى

Yellowing of new leaves

اصفرار