Jacaranda mimosifolia D.Don- Black Poui

Monograph

Martina Alban Daireaux - *Jacaranda mimosifolia*

Colegio Bolívar

Agricultural Plant Science

Dr. Wojciech Waliszewski

Word Count: 9254

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Chapter 1.0 Introduction

Jacaranda mimosifolia, an iconic species recognized globally for its violet canopy, represents far more than an ornamental tree: it is the outcome of a long evolutionary, ecological, and climatic history that has shaped its physiology and geographic distribution. Understanding this species requires an integrated analysis of its taxonomy, fossil lineage, biogeographical origins, and the environmental factors that determine its growth. This chapter examines *Jacaranda mimosifolia* from the broad perspective of its classification within the plant kingdom to the specific environmental conditions; light, temperature, water availability, soil composition, and geological substrates, that define its ecological niche. The chapter begins by situating *J. mimosifolia* within the taxonomic hierarchy established by early botanical authorities such as David Don, followed by an exploration of fossil evidence that traces the evolutionary roots of the Bignoniaceae family across the Neogene and Quaternary periods. It further analyzes the species native distribution in the Southern Andean Yungas, Dry Chaco, and surrounding subtropical ecoregions, and expands to its global naturalization in warm temperate and subtropical regions. Finally, it details the climate, soil, and hydrological regimes necessary for the species development, describing how light intensity, temperature variation, and water dynamics drive its physiological performance. Altogether, this chapter provides the foundational ecological and evolutionary context necessary for understanding the agroecological significance and adaptability of *Jacaranda mimosifolia*.

Chapter 2.0 Agroecology

2.1 Taxonomy

2.1.1 Botanical Authority

The botanical authority of the *Jacaranda mimosifolia* is attributed to a Scottish botanist called David Don, born in 1799 and deceased in 1841. His name is often abbreviated as “D.Don” and put after the species name. He first officially described and published the species in 1822 in *The Botanical Register* (Vol. 8, plate 631), which made him the recognized authority. In botanical nomenclature, the authority designation refers to the scientist who first described the species in accordance with accepted scientific rules (Florida Plant Atlas, n.d.). For this species, Don's original description remains the accepted one across major plant databases like the USDA PLANTS and Plants of the World Online (POWO) (Royal Botanic Gardens, Kew, n.d.). In 1992, a lectotype (an illustration from Don's publication) was designated by Gentry and Morawetz in *Flora Neotropica*, securing the reference specimen for the species. This recognition of Don's work highlights the historical origins of the plants taxonomy and the refinement of classification practices through modern botanical standards.

Table 1 Taxonomy of *Jacaranda Mimosifolia*

Taxonomy Ranks	**Taxon Name (Authority)**
Kingdom	*Plantae- Plants*
Subkingdom	*Tracheobionta- Vascular plants*
Superdivision	*Spermatophyta- Seed plants*
Division	*Magnoliophyta- Flowering plants*
Class	*Magnoliophyta- Dicotyledons*
Subclass	*Asteridae*
Order	*Scrophulariales*
Family	*Bignoiaceae Juss- Trumpet-Creeper family*
Genus	*Jacaranda Juss- Jacaranda*
Species	*Jacaranda mimosifolia* D.Don- Black Poui

Note: This information about the hierarchy of the *Jacaranda Mimosfilia* is taken from USDA Plant Database (USDA, 2025).

2.1.2 Rank Summary

The hierarchy of the *Jacaranda mimosfilia* begins at its general **kingdom**, the *Plantae* (plants). This category is very broad and is used to identify the species as a photosynthetic, eukaryotic organism (Learning with Experts, 2024). Over 300,000 species classify to the *Plantae* Kingdom (Principles of Biology II, OL ed, n.d.). The **subkingdom** *Tracheobionta* includes vascular plants,

which have specific tissues that transport water and nutrients, they are called Xylem and Phloem (Royal Botanic Gardens, 1822). The **superdivision** *Spermatophyta* refers to plants that bear seeds, key for evolutionary advancement that protects embryos and allows for greater dispersal (Royal Botanic Gardens, 1822). About 260,000 species classify as *Spermatophyta* (Principles of Biology II, OL ed, n.d.).

Figure 1

Bipinnate compound leaves of *Jacaranda mimosifolia* (Royal Botanical Garden)
https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:130936-2/general-information

Figure 2

Bignoniaceae Family, Trumpet-Creeper flowers (Bakker)
https://en-gb.bakker.com/products/trumpet-flower-campsis-gold-trumpet-yellow-hardy-plant

Figure 3

Jacaranda mimosifolia Species (Sabai Innovations)
https://agrogreeninfotech.com/product/jacaranda-mimosifolia-neel-mohar-flower-avenue-trees/

The **division** *Magnoliophyta* identifies flowering plants (more specifically angiosperms), which basically refers to plants that produce flowers and enclose their seeds within fruits. Within this division, the **class** *Magnoliophyta* (*Dicotyledons*) describes plants with two embryonic seed leaves (*cotyledons*) and net like leaf venation. These are dicot plants that typically grow Bipinnate Compound Leaves with reticulate (net like) venation (pattern), which helps distribute water, nutrients, and mechanical support efficiently through the leaf blade; this is the case for the *Jacaranda mimosifolia* (Simpson, 2019). The Magnoliophyta is the largest division within seed plants, standing at more than 280,000 species that classify as this class rank (Principles of Biology II, OL ed, n.d.). The **subclass** *Asteridae* groups dicots that share certain biochemical and floral traits. The **order** classifies Jacaranda as *Scrophulariales*, which contains species often

associated with symbiotic or ornamental features. The **family** *Bignoniaceae* is known as the trumpet-creeper family, which are often tropical trees and vines with showy tubular flowers. Only about 800 species are a part of the *Bignoniaceae* family (Mahindra Nursery, 2023). Most of the *Bignonianceae* classified plants also have bipinnate compound leaves, including the Jacaranda Mimosifolia. The **genus** *Jacaranda* includes ornamental trees recognized for their purple and blue blossoms. Between 40 and 50 species classify as *Jacaranda* for the Genus rank (Encyclopedia Britannica, 2025). Lastly, the **species** *Jacaranda mimosifolia* is the singular species that identifies as the purple/blue Jacaranda itself, a tree admired for its beauty, ecological and medical roles.

2.2 Fossil Records

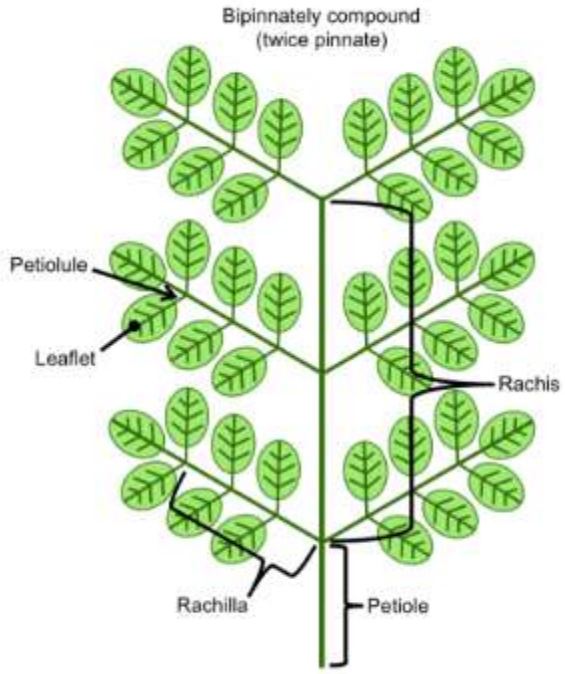
The fossil history of *Jacaranda mimosifolia* provides a fascinating view into the evolution of one of the most recognized members of the Bignoniaceae family, also known as the trumpet-creeper family. This family, classified within the order Scrophulariales and subclass Asteridae, includes approximately 800 tropical and subtropical species (Mahindra Nursery, 2023). Members of the Bignoniaceae share distinctive features such as bipinnate compound leaves, tubular flowers, and woody or climbing habits, traits that have a deep evolutionary history. Fossil evidence, while limited, demonstrates that the Bignoniaceae have existed in the Neotropics for millions of years, supporting the idea that *Jacaranda mimosifolia* and its relatives have been a part of South America's botanical heritage for a long time.

Figure 4

Flower of Jacaranda mimosifolia, Trumper-Creeper Family (Grow Billion Trees)
https://growbilliontrees.com/blogs/tree-stories/jacaranda-blue-tree-stunning-blooms-shade-provider-and-urban-beauty?srsltid=AfmBOoqcX1sT5QkdiZSCJ0_HnCZzXDKXTyxsSYuW_pspBtRdU0OAUc3G

Even though no fossils can be definitively assigned to *Jacaranda mimosifolia* itself, paleobotanical discoveries at the genus and family levels strongly indicate the ancient presence on this lineage. One of the earliest genus-level records was described by E.W. Berry (1933), who identified *Jacaranda* tertiary from Pliocene-age deposits in Brazil. Berry's findings consisted of well-preserved fossil leaves that displayed morphological features typical of living *Jacaranda* species such as bipinnate venation and elliptical leaflets, allowing the fossil to be confidently placed within the genus. This discovery situated *Jacaranda* in South America by at least the late Neogene, providing tangible evidence for the long-term continuity of the genus in its modern geographic region (Berry, 1933).

Figure 5



Labeled diagram of bipinnately compound leaves fossils (Digital Atlas of Ancient Life) https://www.digitalatlasofancientlife.org/learn/embryophytes/tracheophytes/leaves/

At the broader family level, fossil evidence further supports the deep temporal origins of the Bignoniaceae. In a detailed study, Moya and Brea (2018) described fossilized wood from the Late Pleistocene Arroyo Feliciano Formation in the northeastern Argentina that shares key anatomical traits with modern Bignoniaceae genera such as Tabebuia, Tecoma, and Handroanthus. These fossils, characterized by diffuse-porous vessels, simple perforation plates, and vasicentric axial parenchyma, represent the first Pleistocene fossil woods of the family reported in the Americas. The discovery extends the known biochron of the Bignoniaceae and confirms the persistence of the family's woody representatives through multiple climatic fluctuations during the Quaternary period (Moya & Brea, 2018).

Complementary evidence emerges from the Miocene epoch, when Franco, Brea, and Cerdeño Serrano (2021) described permineralized stems of a fossil liana identified as Dolichandra pacei, another member of the Bignoniaceae. This finding is significant because it provides the first confirmed fossil evidence of the climbing habit that classifies many modern Bignoniaceae species. The anatomical adaptations of these fossils, such as phloem wedges and cambial variants, reveal that the family's ecological diversity, encompassing both trees like *Jacaranda Mimosifolia* and lianas such as Dolichandra, was already established by the Miocene (Franco et al., 2021)

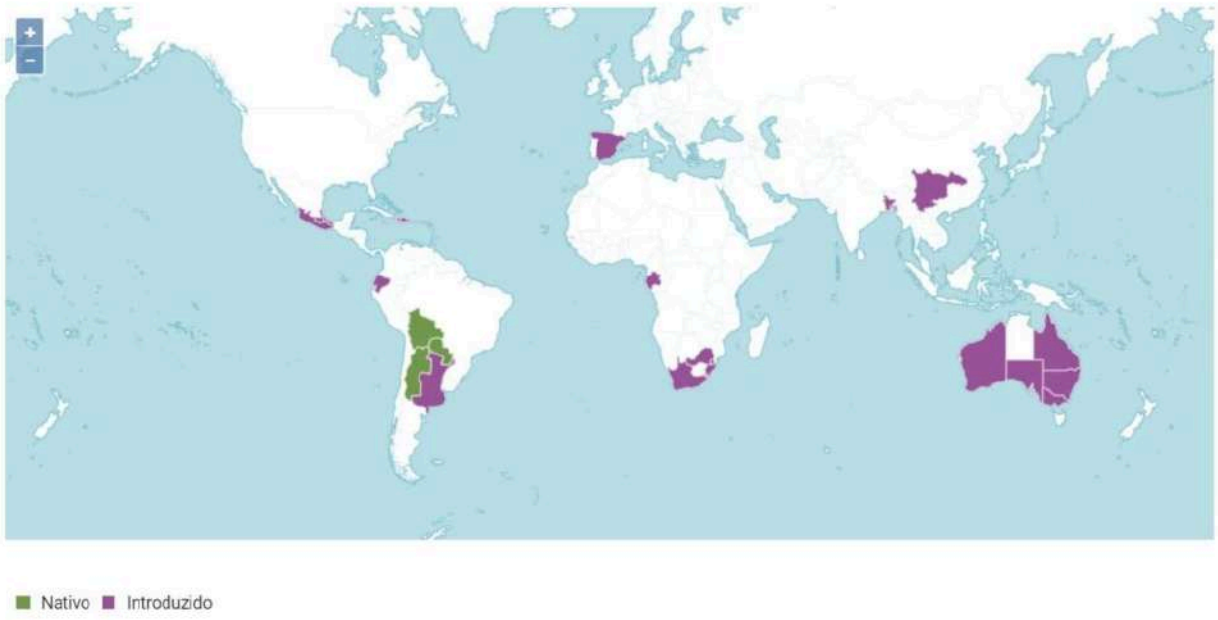
Together, these fossil discoveries portray the Bignoniaceae as an ancient Neotropical family whose morphological traits and ecological roles have been remarkably consistent through time. While the direct fossil evidence of *Jacaranda mimosifolia* remains absent, the fossil *Jacaranda* tertiary and related Bignonianceae fossils in South America firmly prove the lineage within the Neogene-Quaternary timeframe. This record aligns with the modern distribution of *Jacaranda mimosifolia*, native to northwestern Argentina and Bolivia, suggesting that this species may be the modern descendant of a lineage that has inhabited South America for millions of years. Such continuity supports the idea that *J.mimosifolia* represents not only aesthetic and ecological value today but also an enduring evolutionary legacy of the Neotropical flora.

2.3 Origin and Current Distribution

Beyond its native South American range, *J.mimosifolia* has become widely naturalized and cultivated around the world. It grows successfully in southern Africa (notably South Africa and Zimbabwe), Australia, New Zealand, India, China, Israel, and southern Spain, as well as in the southern United States (especially California, Florida, and Texas). In these regions, the species

often occupies a similar ecological role, subtropical or warm-temperature lowlands and hillside with ample sunlight, well drained soils, and mild winters, mirroring the environmental profile of its South American homeland.

Figure 6



Native and introduced geographic locations of *Jacaranda mimosifolia* (Royal Botanical Gardens) https://colplanta.org/taxon/urn%3Alsid%3Aipni.org%3Anames%3A130936-2

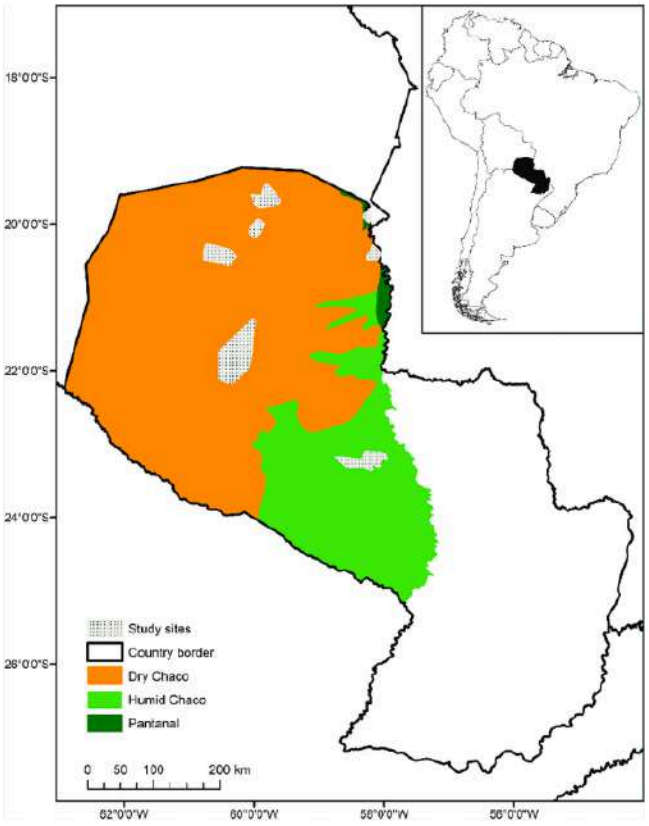
2.4 Ecoregion and Natural Habitat

The species *Jacaranda mimosifolia* (family Bignoniaceae) is native to parts of south-central South America, specifically northwestern Argentina (provinces of Salta, Jujuy, Catamarca), southern Bolivia and southern Brazil, and extends into associated regions of Paraguay and Uruguay. Within its native range, the species occupies somewhat diverse ecoregions, for example, it is found in the Dry Chaco region (Argentina, Paraguay, Bolivia and parts of Brazil), the southern Andean Yungas (Argentina and Bolivia), the Flooded Savannas and inter-andean valleys (Bolivia, Argentina, and Paraguay) (Scientific Lib, n.d.). These landscapes range from

semi-arid savannas and dry forests to subtropical mountain ranges with elevations between 500 and 2,600 meters above sea level (Scientific Lib, n.d.).

The Dry Chaco, a vast subtropical lowland plain extending through Argentina, Paraguay, Bolivia, and Brazil, is characterized by deciduous dry forests and savanna vegetation. In contrast, the SouthernAndean Yungas, which run along the eastern slopes of the Andes in Argentina and Bolivia, consist of humid montane forests that experience a pronounced wet-dry seasonal pattern (Scientific Lib, n.d.). *J. mimosifolia* thrives in transitional zones of these landscapes, such as valley bottoms, forest edges, and open woodland slopes, where sunlight is abundant and soils are well drained (World Agroforestry, 2024).

Figure 7



Dry chaco area, where *Jacaranda mimosifolia* is prosperous (Research Gate)
https://www.researchgate.net/figure/Map-showing-the-location-of-Paraguay-in-South-America-the-distribution-of-the-Dry-and_fig1_323465726

Because it evolved in semi-open subtropical forests and savannas, *Jacaranda mimosifolia* is not an understorey species. Instead, it functions as a canopy tree adapted to full sunlight or light shade (About Garden Design, 2023). Its natural habitat can therefore be described as subtropical-montane savanna woodland, featuring moderate rainfall, alternating dry and wet seasons, and high solar exposure, ecological factors that have strongly influenced the trees physiology and global adaptability.

2.5 Climate Preferences, Light Regime, and Growth Habit

Climatically, *Jacaranda mimosifolia* performs best in warm, seasonally moist regions where mean annual temperatures are around 20 celsius and annual rainfall ranges from 900 to 1,300 mm (World Agroforestry, 2024). These conditions characterize much of its native Andean Yungas and Chaco range. The species is frost-sensitive, with young trees damaged at temperatures below 0 celsius and mature individuals tolerating only short, mild frosts (down to approximately -7 celsius).

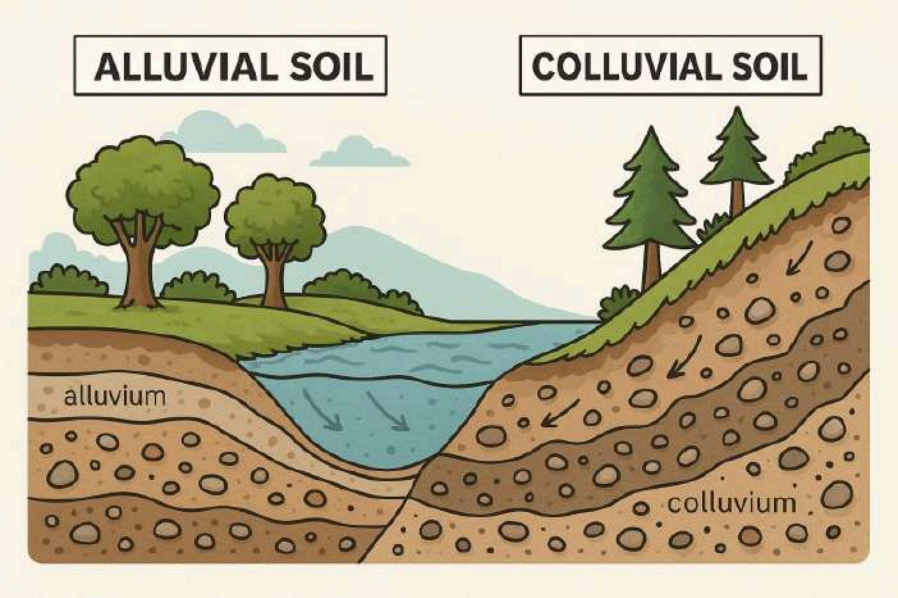
In terms of light requirements, *J.mimosifolia* is a heliophilous (sun loving) species that thrives in full sun and only tolerates light shade. It typically occupies open forest edges, riverbanks, and sunny valley slopes, rarely persisting under dense canopy cover (About Garden Design, 2023). This growth behaviour explains its success as an ornamental street and garden tree in tropical and subtropical cities worldwide, from Pretoria (South Africa) to Sydney (Australia) and Los Angeles (USA), where it forms a vibrant part of the urban canopy.

Soil conditions preferred by *J. mimosifolia* include well drained sandy or loamy soils, often slightly acidic, with good aeration and moderate fertility (World Agroforestry, 2024). The tree does not tolerate waterlogged or compacted soils, which can lead to root decay. In both natural and cultivated habitats these soil preferences correspond closely to its montane-savanna origin, where rainfall is seasonal and drainage is efficient. Collectively, its climate and ecological profile defines *J. mimosifolia* as a subtropical, sun-adapted tree evolved for moderate rainfall, warm temperatures, and open-canopy conditions, making it one of the most ecologically flexible and aesthetically valued trees in the world.

2.6 Soils and Geology

The growth and distribution of *Jacaranda mimosifolia* are strongly influenced by the physical and chemical properties of the soils and the underlying geological formations found in its native ecoregions of northwestern Argentina, southern Bolivia, southern Brazil, and Paraguay. These areas are full of alluvial (materials like sand or mud dropped by rivers) and colluvial (materials like rocks or soil that move down slopes or hills) deposits derived from the Andean mountain system and adjacent sedimentary basins (low area of land where water or sediments collect) (Scientific Lib, n.d.; World Agroforestry, 2024). The geological substrate in these regions typically consists of weathered metamorphic and sedimentary rocks, such as shales, sandstones, and siltstones, which over time produce well-drained, moderately fertile soils, ideal conditions for *Jacaranda mimosifolia* (World Agroforestry, 2024).

Figure 8



Ideal soil for *Jacaranda Mimosifolia* growth in Alluvial soil (Iowa State University) https://www.agron.iastate.edu/glsi/blog/colluvium-vs-alluvium/

In its native range, the species thrives in loamy and sandy loam soils with neutral to slightly acidic pH levels, generally ranging from 5.5 to 7.0 (World Agroforestry, 2024). These soils are characterized by good aeration and high porosity, allowing roots to access both oxygen and moisture while preventing waterlogging. Such conditions are particularly important because the *Jacarandas* root system is sensitive to compacted or water-saturated soils, which can lead to oxygen deprivation and root decay (Maestro Virtuale, 2024). The well drained texture of loamy soils, formed from a balanced mix of sands, silt, and clay, enables moderate water retention and rapid drainage, maintaining consistent moisture levels during the wet and dry seasons typical of subtropical montane environments (World Agroforestry, 2024).

Organic matter levels in these soils tend to be moderate to high, reflecting seasonal litterfall from surrounding forest vegetation. This layer of decomposed organic material enriches the upper soil

horizon with nitrogen, phosphorus, and potassium, which are essential nutrients for *Jacaranda mimosifolias* rapid vegetative growth and its production of large, violet-blue inflorescences (Maestro Virtuale, 2024). Moreover, the natural decomposition of organic matter improves soil structure by increasing aggregation and water infiltration capacity, thus supporting the species preference for deep, fertile, and friable topsoils.

The geological foundation of *Jacaranda mimosifolias* native ecoregions plays a direct role in shaping these ideal soil properties. In the Andean foothills and inter Andean valleys, the continual weathering of igneous and sedimentary rocks contributes minerals such as iron, calcium, magnesium, and potassium, which promote healthy foliage and flowering (MinIO SciELO, 2023). The Chaco and Yungas regions, where many *Jacaranda* populations occur, are underlain by nutrient rich alluvial sediments carried by river systems draining the Andes (Scientific Lib, n.d.). These deposits create deep, well structured soils that support robust root systems and sustained growth, even under moderate seasonal drought.

Figure 9

The Chaco and Yungas regions, areas of Jacaranda prosperity in Bolivia (Explore Bolivia) https://explorebolivia.com/our-country/map-of-bolivia/

Additionally, *Jacaranda mimosifolia* shows low tolerance to salinity and alkaline soils, explaining its absence in coastal or arid saline environments (World Agroforestry, 2024). It grows poorly in calcareous or highly basic substrates because these limit the bioavailability of micronutrients such as iron and manganese, leading to chlorosis (yellowing of leaves). The preference for acidic to neutral, non-saline soils corresponds closely to the weathering profiles of the subtropical montane and alluvial soils of its origin, where leaching and organic accumulation maintain moderate acidity and fertility.

In summary, *Jacaranda mimosifolia* naturally grows in deep, well drained, loamy soils formed from weathered sedimentary and metamorphic rocks of the Andean and Chaco regions. These soils are natural to slightly acidic, with moderate organic content, good aeration, and low salinity, all of which are essential for optimal nutrient uptake and root respiration. The combination of

geology and soil processes in these subtropical montane environments provides the structural stability, fertility, and drainage conditions that enable *Jacaranda mimosifolia* to thrive and develop its beautiful canopy of violet blossoms.

Figure 10

Andean and Chaco regions between Bolivia, Brazil, Paraguay, and Argentina (The Nature Conservancy https://www.nature.org/es-us/sobre-tnc/donde-trabajamos/tnc-en-latinoamerica/informe-anual-2021/proporcionar-agua-alimentos-forma-sostenible/

2.7 Water and Evapotranspiration

Water availability plays an equally important role in the growth and survival of *Jacaranda mimosifolia.* In its native environment, annual precipitation averages between 900 mm and 1,300 mm, distributed mainly over a summer rainy season followed by a drier winter period (World Agroforestry, 2024). The tree is moderately drought-tolerant once established, thanks to a deep, extensive root system and compound leaves that reduce evapotranspiration by minimizing direct sunlight exposure per unit leaf area (Maestro Virtuale, 2024). During dry months, the species

often undergoes partial leaf drop, a physiological adaptation that conserves water by reducing transpiration losses while maintaining enough photosynthetic tissue for energy production.

Because J. mimosifolia evolved in well-drained montane soils, it prefers moderate soil moisture and is intolerant of waterlogging (World Agroforestry, 2024). Constantly saturated soils limit oxygen diffusion to the roots, leading to root rot and reduced growth. Conversely, under short-term drought, the tree maintains turgor pressure through osmotic adjustment and recovers rapidly with renewed rainfall. In cultivation, optimal growth occurs when soils are kept evenly moist but not saturated, replicating the alternating wet–dry rhythm of its natural ecosystem.

In summary, *Jacaranda mimosifolia* is physiologically adapted to bright sunlight, warm temperatures, and seasonally variable rainfall. It thrives in climates with high solar radiation, daytime warmth, and cool but frost-free nights. These environmental preferences reflect the species subtropical montane origin and explain its success as a globally cultivated ornamental tree in regions that mirror the thermal and hydrological rhythms of its South American homeland.

2.8 Light and Temperature regimes

2.8.1 Light, Temperature, and Water

The physiological traits of *Jacaranda mimosifolia* are closely connected to the light intensity, temperature regime, and water availability that characterize its native subtropical mountainous environments. Originating from regions such as the Southern Andean Yungas and Dry Chaco of Argentina and Bolivia, the species has adapted to warm and seasonally moist climates with

notorious variations between day and night temperatures and a distinct alternation between wet and dry seasons (World Agroforestry, 2024) (Scientific Lib, n.d.).

2.8.2 Light Requirements

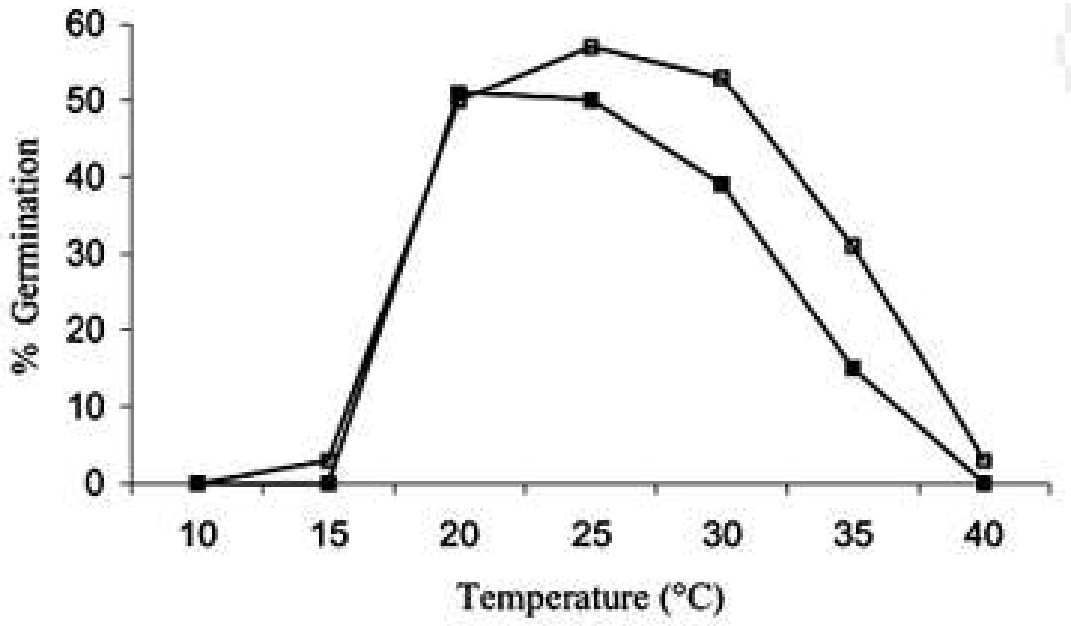
Jacaranda mimosifolia is a heliophilous (sun loving) tree species. In its natural range, it typically grows in open woodlands, river valleys, and forest edges, where solar radiation is high throughout most of the year (About Garden Design, 2023). These environments receive 10-12 hours of sunlight daily during the growing season, and the *Jacaranda's* compound, finely divided leaves maximize photosynthetic efficiency while reducing water loss through transpiration. The tree performs poorly under shade, which limits both flowering and leaf development (Maestro Virtuale, 2024). Thus, in contrast to forest-floor herbs like Tricyrtis daniellii that require low light levels, J. mimosifolia depends on full, direct sunlight to maintain normal growth and to trigger its characteristic profuse violet flowering during late spring and early summer.

2.8.3 Temperature Regime

The optimal temperature range for *J. mimosifolia* corresponds to the moderate subtropical conditions of its native ecoregions, with daytime temperatures between 20 degrees Celsius and 30 degrees Celsius and night time lows of 10 degrees Celsius to 18 degrees Celsius (Maestro Virtuale, 2024). The species exhibits steady vegetative growth under these warm conditions and begins flowering as temperatures increase toward the upper end of that range. It is intolerant of frost, as tissues are damaged when exposed to sustained temperatures below 0 degrees Celsius, although mature trees can survive short cold spells down to about -7 degrees Celsius. Unlike certain temperate deciduous trees, *J. mimosifolia* does not require a cold dormancy period to

initiate flowering or new leaf growth. Instead, its phenology is regulated primarily by temperature rise and photoperiod, that is, longer days and warmer temperatures following the dry season stimulate bud break and bloom (World Agroforestry, 2024).

Figure 11



Temperature correlation with growth of *Jacaranda mimosifolia* in Brazil (Socolowski **&**Takak, 2004) https://www.scielo.br/j/babt/a/6xLGzcDCXnRcqCg6kxDNDQv/?format=html&lang=en

Annual thermal variations across its natural range show average mean annual temperatures around 19-22 celsius, with the warmest months (December-February in the Southern Hemisphere) reaching up to 32 celsius and the coolest months (June-August) rarely dropping below 10 celsius (Scientific Lib, n.d.). This moderate thermal amplitude supports continuous physiological activity, explaining why the species thrives in regions such as northern Argentina, southern Brazil, and Bolivia, as well as in other global subtropical regions where similar regimes occur, including southern Africa, Australia, India, and southern California (World Agroforestry, 2024).

Chapter 2 Conclusion

The analysis presented in this chapter demonstrates that *Jacaranda mimosifolia* is the product of a highly specialized yet ecologically flexible evolutionary lineage. Its taxonomic placement within the Bignoniaceae family connects it to a deep fossil record, ranging from Pliocene leaf impressions to Miocene liana stems, that confirms the long-standing presence of this plant group in the Neotropics. The species' origin in the subtropical montane regions of northwestern Argentina, Bolivia, Paraguay, and southern Brazil explains its preference for warm climates, abundant sunlight, and seasonally variable precipitation, as well as its sensitivity to frost and need for well-drained soils formed from Andean-derived alluvial and colluvial sediments. Moreover, its physiological adaptations (such as compound leaves that reduce evapotranspiration and flowering patterns triggered by increasing photoperiod and temperature) reflect an evolutionary response to the pronounced dry and wet seasonality of its native habitats.

These ecological and physiological traits have enabled *J. mimosifolia* to become widely naturalized across multiple continents, occupying urban and semi-natural environments that replicate the climatic and edaphic conditions of its homeland. By integrating taxonomy, fossil evidence, geographical origin, habitat characteristics, climate requirements, soil properties, and hydrological processes, this chapter establishes a comprehensive understanding of the environmental foundation that sustains this species. This framework not only contextualizes the ecological success and global distribution of *J. mimosifolia* but also provides the basis for subsequent chapters that will explore its agroecological applications, management, and broader environmental significance.

Chapter 3.0 Biology

3.1 Cellular and Molecular Composition

At its cellular level, *Jacaranda mimosifolia* has standard features of woody dicotylendonous angiosperms (RBGKew, 2024). This includes cells with a rigid cellulose cell wall, large central vacuoles (which are membrane bound organelles that can be found in both animals and plants) for storage, chloroplasts in the leaf mesophyll (inner tissue of a leaf) for photosynthesis, and well developed xylem (the vascular tissue that conducts water and dissolves nutrients upwards from the roots) and phloem (the vascular tissue that transports and distributes the organic nutrients) for support and transport (Evert, 2006).

Figure 12

Cellular level, dicotylendonous angiosperms of a *Jacaranda mimosifolia* (Berkshire Community College, 2014). https://www.flickr.com/photos/146824358@N03/34318969724

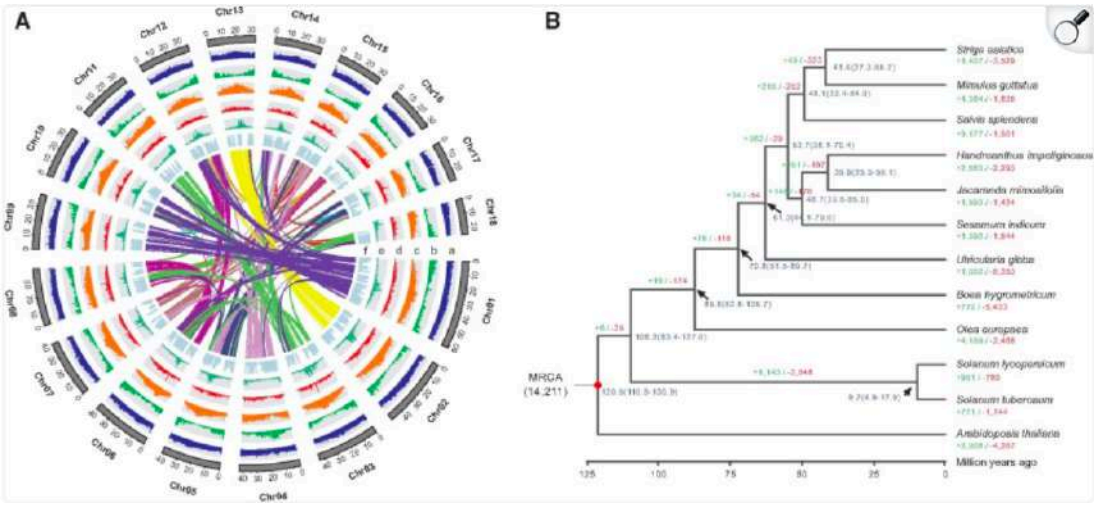
General plant cell biology applies, including chloroplast based light harvesting and Rubisco (an enzyme) conducted carbon fixation. Secondary metabolites including flavonoids, phenylenthanoid glycosides, jacaranone, and jacaric acid have been isolated from *Jacaranda*

tissues (IAWACommittee, 1989). These compounds have antioxidant and antimicrobial activity and reflect specialized cellular pathways for secondary metabolism, which are common in this genus and contribute to its medicinal potential (Taiz, 2015).

3.2 Genome Organization and Chromosome Complement

A high quality chromosome level genome assembly of *J. mimosifolia* reveals a genome size of approximately 707 Mb, with 18 pseudochromosomes assembled, indicating a well organized and relatively compact genome compared to many other trees (Zhang, 2022). Around 30,507 protein coding genes were annotated, with broad representation across metabolic, developmental, and stress response pathways (Zhang, 2022). The genome is rich in repetitive elements (56.8%), especially retrotransposons such as Copia and Gypsy elements, a common feature in plant genomes that can contribute to variation and evolution (Zhang, 2022; Taiz, 2015). Phylogenetic analysis places *J. mimosifolia* in close relation to Hanroanthus impetiginosus, reflecting shared evolutionary history within the family Bignoniaceae (Zhang, 2022; Gentry, 1992). This genomic resource enables exploration of traits such as flower color, environmental adaptation, and biosynthesis of active compounds.

Figure 13



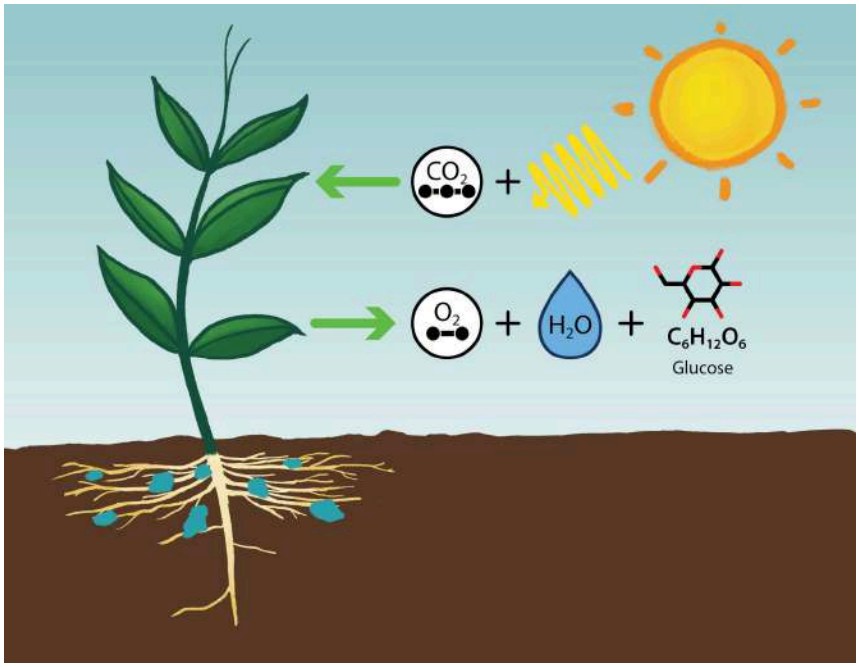
Chromosome structure of the *Jacaranda mimosifolia* (Zhang, 2022).
https://pmc.ncbi.nlm.nih.gov/articles/PMC8214407/

Cytogenetic analyses across *Jacaranda* species show a stable chromosome number of 2n=36 with symmetrical karyotypes, consistent across the genus and indicating chromosomal conservation (Gentry, 1992).

3.3 Metabolism and Energy Acquisition

Jacaranda mimosifolia utilizes the C3 photosynthetic pathway, the most common form of carbon fixation in temperate and subtropical trees (Taiz, 2015). In this pathway, the atmospheric CO2 enters through stomata in leaf tissues and is fixed into carbohydrates through the calvin cycle in chloroplasts, driven by light reactions in thylakoid membranes (Taiz, 2015). The large bipinnate compound leaves with numerous small leaflets maximize light interception and photosynthetic capacity during the growing season, especially in full sun (Gilman, 2014). Environmental conditions such as temperature and mousture strongly influence photosynthetic efficiency: adequate water supports leaf turgor and stomatal opening, while drought induces leaf yellowing and reduced photosynthesis (Taiz, 2015; Gilman, 2014).

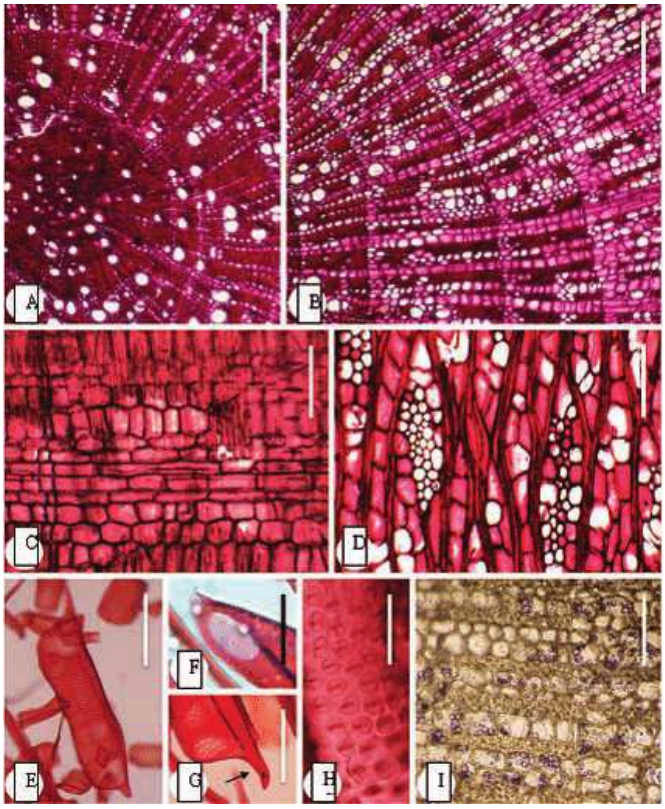
Figure 14



Photosynthesis demonstration. The leaf of *Jacaranda mimosifolia* processes the light energy through thylakoid membranes (Taiz, 2015). https://ugc.berkeley.edu/background-content/photosynthesis/

In addition to primary metabolism, *Jacaranda* tissues synthesize secondary metabolites such as flavanoids and jacaric acid, which may play roles in defense, stress tolerance, and interactions with herbivores and microbes (Taiz, 2015; Gentry, 1992).

Figure 15



Tissues of a *Jacaranda* tree, through which the secondary metabolites process energy and nutrients (Taiz, 2015; Gentry, 1992)
https://www.researchgate.net/figure/Wood-anatomy-of-xylopodium-of-Jacaranda-ulei-A-Transversal-section-showing-diffuse_fig1_330207993

3.4 Anatomy and Morphological Characteristics

Jacaranda mimosifolia is a medium to large deciduous tree reaching 12-20 m in height with an open, spreading crown and slender twigs (Gilman, 2014; RBGKew, 2024). The bark is grayish brown, smooth in youth, and becomes flaky with age (Gilman, 2014). Leaves are bipinnately compound, up to 45 cm long, with many small, soft leaflets optimized for light capture and gas exchange (RBGKew, 2024). Its flowers are tubular, bluish purple, and aromatic. They are arranged in large terminal panicles, and can persist on the tree for several weeks in spring (Gilman, 2014). Following pollination, the tree produces woody, flat seed capsules (about 3-6 cm across) that mature over months and split to release numerous winged seeds adapted for wind dispersal (RBGKew, 2024; Gentry, 1992). Overall, the morphology reflects adaptation to open,

sunlit environments, and a balance of reproductive and vegetative structures suited to subtropical climates (Gilman, 2014).

Figure 16

Physical features of the *Jacaranda mimosifolia* leaves and flowers (Gilman, 2014). https://www.ubuy.com.co/sp/product/G66Z7T6BC-blue-purple-jacaranda-jacaranda-mimosifolia-tree-shrub-heirloom-30-bulk-seeds?srsltid=AfmBOorCtTx6g94IPgvB0gm7Cumb0iOuTboSsQcqcCPj5Vpi8OFRHMMQ

3.5 Growth Form and Developmental Patterns

J. mimosifolia exhibits a moderate to rapid growth rate under favorable conditions, especially in full sun and well hydrated soils (Gilman, 2014). Young trees allocate resources to height growth first, often increasing several meters in early years, then gradually branch out as they mature (Evert, 2006). Root systems are deep and non-invasive, making them adaptable to urban planting where soil space is sufficient (Gilman, 2014). In cultivation, pruning is often recommended to train strong branch architecture and reduce hazards, since unpruned trees may develop weak crotches prone to splitting (Gilman, 2014). Water availability strongly influences growth:

drought stress leads to leaf yellowing and growth suppression, whereas adequate moisture supports robust leaf and shoot development (Gilman, 2014; Taiz, 2015).

Figure 17

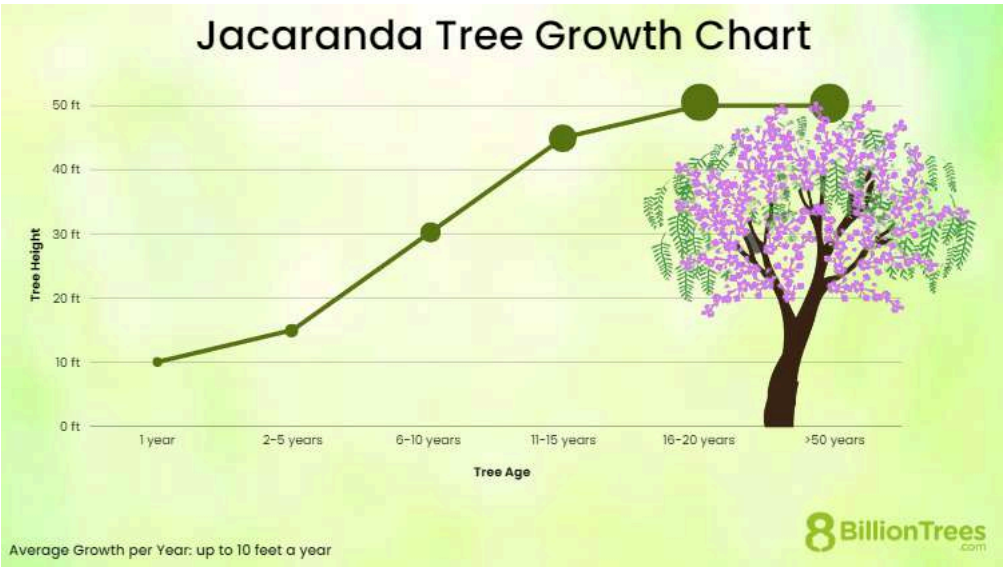
Healthy, hydrated *Jacaranda mimosifolia*
https://dhseedharvestco.com/products/jacaranda-mimosifolia-blue-jacaranda?srsltid=AfmBOoqi3vp-mwilsfKYIj3Ul9-ivLoJIhWsZEHl05_3_5H5EygeFZ_d

3.6 Life Cycle and Phenology

Jacaranda mimosifolia shows a distinct annual cycle strongly tied to temperature accumulation, best described by an extended BBCH phenological scale (Gandía-Ventura et al., 2025). The life cycle begins with dormancy and bud swelling after cooler periods, followed by leaf emergence once sufficient growing degree days (GDD) accumulate (Gandía-Ventura et al., 2025). In Mediterranean climates, leaf development typically begins in early spring as temperatures rise (Gilman, 2014). Flower buds emerge and open in late spring to early summer, with peak flowering occurring once the tree has accumulated about 992-1020 GDD (Zhang, 2022). After

flowering, fruit formation and maturation occur through summer into late summer, with woody capsules developing and eventually drying and opening to release new seeds (Gilman, 2014). Overall, *J.mimosifolia* requires approximately 3800 total GDD to complete the cycle from dormancy to leaf senescence, indicating a strong thermal dependence of phenological transitions (Zhang, 2022).

Figure 18



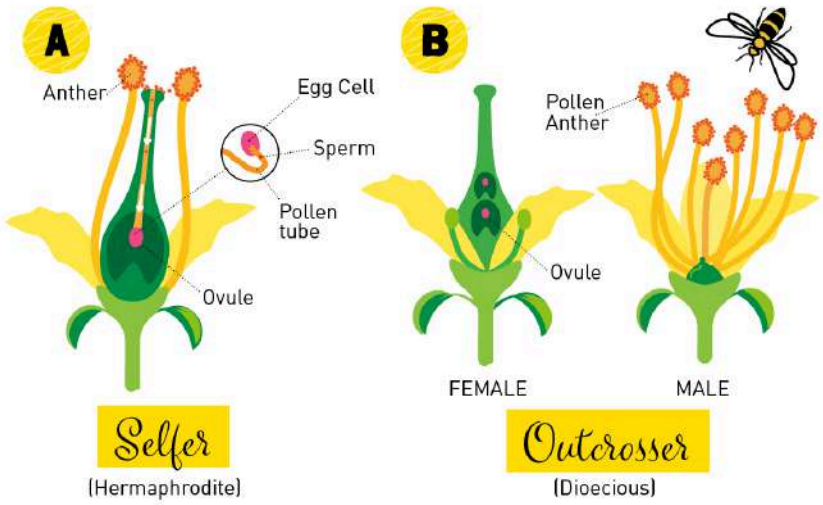
Jacaranda Tree Growth Chart (8 Billion Trees, 2024) https://8billiontrees.com/trees/jacaranda-tree/

3.7 Reproductive Biology

J. mimosifolia is hermaphroditic, with each flower containing both male (stamens) and female (pistil) reproductive organs, enabling potential fertilization but typically benefiting from cross pollination (Gentry, 1992). Flowers are richly nectariferous and attract a variety of insect pollinators, particularly bees, which facilitate pollen transfer (Gentry, 1992; RBGKew, 2024). While detailed pollination studies specific to *J. mimosifolia* are scarce, close relatives in the genus use floral structures and glandular secretions to interact with pollinators, suggesting similar ecological interactions (Gentry, 1992). After successful pollination, fertilized ovules

develop into numerous seeds within woody capsules (RBGKew, 2024). These winged seeds are adapted for wind dispersal, allowing colonization of open spaces, while seedlings require warm, moist conditions to germinate, typically within a few weeks (Gentry, 1992; Gilman, 2014). Cultivated propagation also includes cuttings or grafting, although seed propagation remains common where frost risk is low (Gilman, 2014).

Figure 19



A hermaphroditic plant structure (A model in the image) (HudsonAlpha, 2021)
https://www.hudsonalpha.org/flowering-plants-the-birds-and-the-bees-and-a-little-sneeze/

3.8 Species Interactions

J. mimosifolia interacts with a wide range of pollinators, including bees and potentially birds in some regions, which are attracted to its colorful and nectar rich flowers (Gentry, 1992; RBGKew, 2024). These interactions support pollination and genetic exchange within and between populations (Gentry, 1992). The tree also engages in ecological interactions with soil microbes and mycorrhizae that influence nutrient uptake and soil structure (Taiz, 2015). Its attractive flowers and long flowering periods make it a component of urban ecological networks, supporting pollinator communities and enhancing biodiversity in gardens and parks (Gilman,

2014). In some regions where it is introduced, *J. mimosifolia* can become competitive with native vegetation, establishing in disturbed sites and altering local plant community dynamics.

3.9 Pests, Pathogens, and Diseases

Although generally considered a resilient species, *J. mimosifolia* is susceptible to certain pests and diseases under specific conditions (Gilman, 2014). Aerodispersed pests such as the spiralling whitefly (Aleurodicus dispersus) have been recorded on this species, where they feed on sap and produce honeydew that fosters sooty mold. The polyphagous shot-hole borer (Euwallacea fornicatus) has also been reported as a potential pest, although reproductive host status varies by region. Soil born root rot fungi, including mushroom root rot in poorly drained soils, can weaken or kill trees where waterlogging occurs, making drainage management important in cultivation (Gilman, 2014). Occasional reports also note sap-feeding insect activity and associated fungal sooty molds, which can stress the tree (Gilman, 2014).

Figure 20

Common pest in *Jacaranda mimosifolia* tree (Teo Spengler, 2023).
https://www.gardeningknowhow.com/ornamental/trees/jacaranda/jacaranda-tree-problems.htm

3.10 Population Biology and Genetics

While detailed population genetics of wild *J. mimosifolia* are underrepresented in academic literature, genetic studies using ISSR markers indicate genetic variation among cultivated populations, with implications for propagation and breeding (Wang et al., 2021). Patterns of genetic diversity reflect both historic cultivation and natural variation within native ranges, suggesting that selecting genetically diverse planting stock can support resilience to environmental stressors (Wang et al., 2021). Cultivated populations are also structured by human selection for ornamental traits such as flower color and bloom duration, influencing local genetic variation (Gilman, 2014). In the wild, habitat fragmentation and pressures like land clearing in parts of South America contribute to population decline and genetic isolation (Wang et al., 2021).

Chapter 4.0 Propagation and Management

4.0 Introduction

The successful cultivation and management of *Jacaranda mimosifolia* depends on the understanding of how the species regenerates, grows, and interacts with its environment. While the previous chapters explored the ecological and biological characteristics of the tree, this chapter takes a special focus on the practical aspects of propagation, growth management, and protection from unwanted pests and diseases. Because *J. mimosifolia* is widely planted as an ornamental tree in the tropical and subtropical regions, its cultivation practices have been well documented in horticultural (cultivation management) and agroforestry literature.

This chapter examines both natural and artificial regeneration processes, nursery production techniques, and vegetative propagation methods such as cuttings. It also discusses cultivation practices including soil preparation, fertilization, pruning (trimming), and harvesting of seeds. Finally, the chapter reviews the main pests and diseases affecting the species and outlines strategies for prevention and control. Together, these practices allow growers to maintain healthy trees and ensure sustainable propagation of Jacaranda mimosifolia in both natural and urban landscapes.

Figure 21

Healthy *Jacaranda mimosifolia* (Brighter Blooms, 2019)
https://www.brighterblooms.com/products/jacaranda-tree?srsltid=AfmBOorC_QssS4fxGPqZMFkEyGE1KEWq8fOFbsbyoIpepzEJMD4FRiiu&variant=29391087665213

4.1 Natural Regeneration

Natural regeneration of *Jacaranda mimosifolia* occurs mostly through seeds dispersed from mature trees. After flowering, the species produces woody capsules containing numerous winged seeds that are adapted for wind dispersal (Gentry, 1992). When the capsules dry and split open, the seeds are released and carried by air currents, allowing them to colonize open ground and disturbed habitats.

Figure 22

Dried jacaranda seed pods (PlanetNatural, 2024) https://www.planetnatural.com/jacaranda-tree/

Seed germination typically occurs when in warm and moderately moist conditions. In natural ecosystems, seeds often fall onto loose soil enriched with organic matter from decomposing leaf litter. This environment provides the moisture and nutrients necessary for early seedling growth. Studies show that germination usually happens within two or four weeks when temperatures remain above 18-20 degrees celsius and when the plant has adequate soil moisture (World Agroforestry, 2024).

However, natural regeneration can be limited by several environmental factors. Dense vegetation may prevent sufficient sunlight from reaching young seedlings, since J. mimosifolia is a heliophilous species that requires high light levels for growth (About Garden Design, 2023). Competition from other plants, grazing by herbivores, and seasonal drought can also reduce survival rates of young trees. As a result, natural regeneration is often most successful in open areas such as forest edges, riverbanks, and disturbed sites.

4.2 Vegetation Regeneration

In addition to seed reproduction, *Jacaranda mimosifolia* can regenerate vegetatively under certain conditions. Vegetative regeneration occurs when new plants grow from parts of the parent plant rather than from seeds. This process may occur naturally when branches come into contact with moist soil and develop roots, although this is less common in this species compared to other woody plants.

Vegetative propagation is often used intentionally in horticulture because it allows growers to produce trees that are genetically identical to the parent plant. This is particularly useful for propagating trees with desirable characteristics such as strong flowering, attractive canopy shape, or disease resistance. Clonal propagation ensures that these traits remain consistent in newly grown trees (Gilman & Watson, 2014).

Although vegetative propagation is possible, it is generally less common than seed propagation for *J. mimosifolia*. Nevertheless, techniques such as cuttings and graffiting can be used effectively in nursery settings to produce uniform planting stock.

4.3 Nursery Propagation

Nursery propagation plays an important role in producing healthy *Jacaranda mimosifolia* seedlings for landscaping, agroforestry, and urban planting projects. The most common nursery method involves seed propagation because it is relatively simple and produces large numbers of plants.

Seeds are usually collected from mature capsules once they have dried on the tree. After collection, the capsules are opened to release the seeds, which can then be stored in a cool and

dry environment until planting. Fresh seeds typically show the highest germination rates (World Agroforestry, 2024).

In nursery conditions, seeds are commonly sown in trays or seedbeds containing well drained substrate such as a mixture of sand, compost and loamy soil. The seeds are placed on the soil surface or lightly covered with a thin layer of soil. Germination generally occurs within two to three weeks when the temperatures remain warm and moisture is maintained consistently.

Figure 23

Example of a seed nursery tray, as is used in planting Jacarandas (Ugaoo, 2024)
https://www.ugaoo.com/blogs/gardening-basics/how-to-plant-seeds-in-plant-trays?srsltid=AfmBOoroBYcKdqfhbl9RXKZuXr5Ucp1pcz9FlUkst5ZdsByYue12Mj_k

Young seedlings require regular watering and partial protection from intense sunlight during their earliest stages. As they grow stronger, they can gradually be exposed to full sunlight and eventually transplanted into larger containers or directly into the ground. Proper nursery

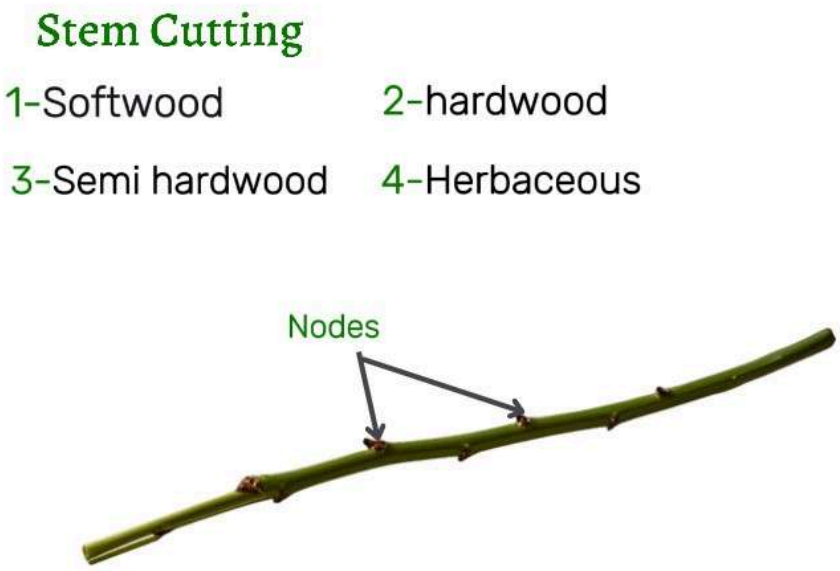
management improves survival rates and ensures strong root development before the trees are planted in their final location (Gilman & Watson, 2014).

4.4 Propagation by Cuttings

Propagation through cuttings is another technique used to produce *Jacaranda mimosifolia* plants. In this method, a section of stem from a healthy parent tree is cut and placed in a suitable rooting medium so that it can develop roots and grow into a new plant.

Semi-hardwood cuttings taken from young branches are generally the most successful. These cuttings are usually about 10-15 cm long and contain several nodes. After cutting, the lower leaves are removed, and the base of the cutting may be treated with a rooting hormone to encourage root formation.

Figure 24



Stem cutting, nodes, and semi hardwood diagram (Garden Chains, 2025)
https://gardenchains.com/types-of-cutting-propagation/

The cuttings are then placed in a moist growing medium, such as sand or a mixture of sand and peat. Maintaining high humidity and moderate temperatures helps promote root development. Under favorable conditions, roots may form within several weeks, allowing the cutting to be transplanted into containers or nursery beds (Mahindra Nursery, 2023).

Figure 25

Example of propagation by cuttings (Gardening Know How, 2021)
https://www.gardeningknowhow.com/garden-how-to/propagation/cuttings/semi-hardwood-propagation.htm

Although this technique requires more care than seed propagation, it allows growers to reproduce trees with specific ornamental characteristics, such as intense flower coloration or particular canopy shapes.

4.5 Planting and Establishment

Once seedlings or propagated plants have reached an appropriate size, they can be transplanted into their permanent growing location. Successful planting requires selecting a site that matches the environmental preferences of *Jacaranda mimosifolia*.

Figure 26

Young Jacaranda ready to be transplanted (Eureka Farms, n.d.)
https://eureka-farms.com/products/jacaranda-tree-mimosifolia?srsltid=AfmBOor5it3cnQ_tyG4RGxGG5SSoma6hn8Y9Esu0JjUSnSLC9f_yJHk4

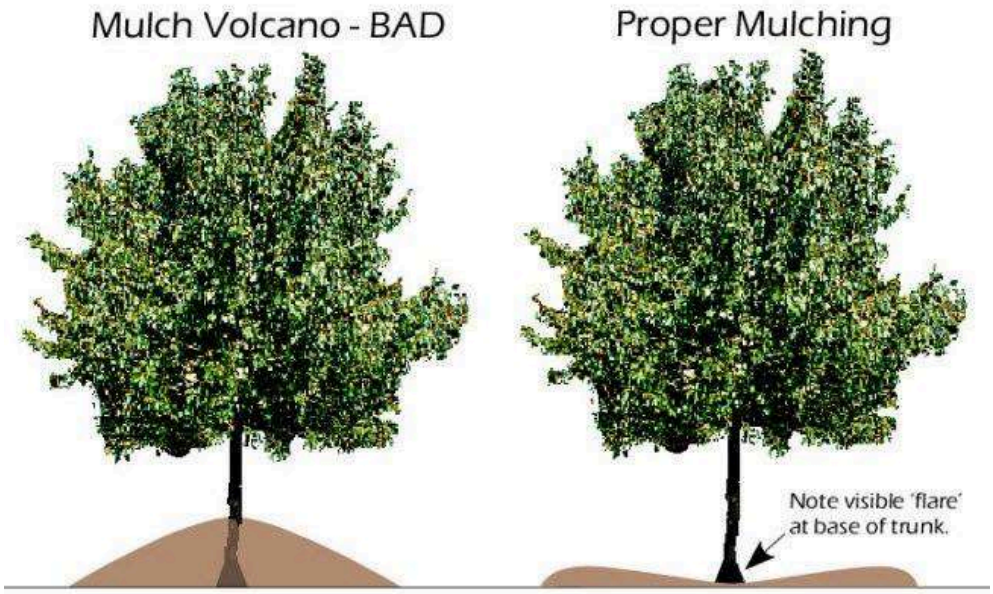
The species grows best in well drained soils and full sunlight (World Agroforestry, 2024). Planting holes should be large enough to accommodate the developing root system and should contain soil enriched with organic matter to support early growth. After planting, the soil around the base of the tree should be gently compacted to eliminate air pockets and stabilize the young plant.

Newly planted trees require consistent watering during the first few months to help roots establish in the surrounding soil. Once the root system develops, the species becomes moderately drought tolerant and requires less frequent irrigation (World Agroforestry, 2024).

4.6 Cultivation Practice

Cultivation practices for *Jacaranda mimosifolia* focus on maintaining healthy soil conditions, adequate sunlight, and sufficient water availability. Because the species evolved in well drained subtropical soils, proper drainage remains essential to prevent root rot and other fungal problems. Mulching around the base of the tree can help maintain soil moisture and improve soil structure as organic materials decompose. Mulch layers also suppress competing weeds that might otherwise compete for nutrients and water.

Figure 27



Demonstration of the proper way to mulch around a transplanted tree (Greenpal, 2026) https://www.yourgreenpal.com/blog/dont-kill-your-trees-make-sure-you-are-mulching-them-the-right-way

Regular monitoring of soil moisture is important during the early stages of growth. Overwatering should be avoided because waterlogged soil conditions limit oxygen availability to the roots and can lead to root decay (Maestro Virtuale, 2024).

4.7 Fertilizing

Fertilization can support healthy growth of *Jacaranda mimosifolia*, particularly in nutrient poor soils. Young trees benefit from balanced fertilizers that provide essential nutrients such as nitrogen, phosphorus and potassium.

Balanced fertilizers containing the primary macronutrients nitrogen (N), phosphorus (P), and potassium (K) can support healthy growth in young trees planted in nutrient poor soils. Extension services that research shade and ornamental tree management suggest using complete fertilizers with a ratio around 3-1-2 (meaning approximately 3 parts nitrogen : 1 part phosphorus : 2 parts potassium) when supplementing tree nutrition. For example, a fertilizer labeled 15-5-10 or 24-8-16 follows this ratio pattern, providing relatively high nitrogen to stimulate vegetative growth while still supplying phosphorus and potassium for root development and overall vigor. Slow release or granular fertilizers with these proportions are commonly recommended for young ornamental and shade trees during their active growth period in spring and early summer. Applying fertilizer based on the tree's trunk size and soil conditions, rather than a fixed universal dose, gives the best results, and soil tests can help refine the exact application rate (Oregon State University, 2024).

Nitrogen promotes vegetative growth and leaf development, phosphorus supports root growth and flowering, and potassium contributes to overall plant health and resistance to environmental stress. Organic fertilizers such as compost or well decomposed manure are often recommended because they gradually release nutrients while improving soil structure (Mahindra Nursery, 2023).

Figure 28

Organic fertilizer ideal for healthy growth of Jacaranda mimosifolia (National Gardening Association, n.d.) https://www.grocery.coop/fresh-from-the-source/growing-your-own-food/using-organic-fertilizers/

Fertilization is typically applied during the early growing season when the tree begins active growth. Excessive fertilizer should be avoided because it can lead to rapid but weak growth that is more susceptible to pests and environmental stress.

4.8 Growth Stages

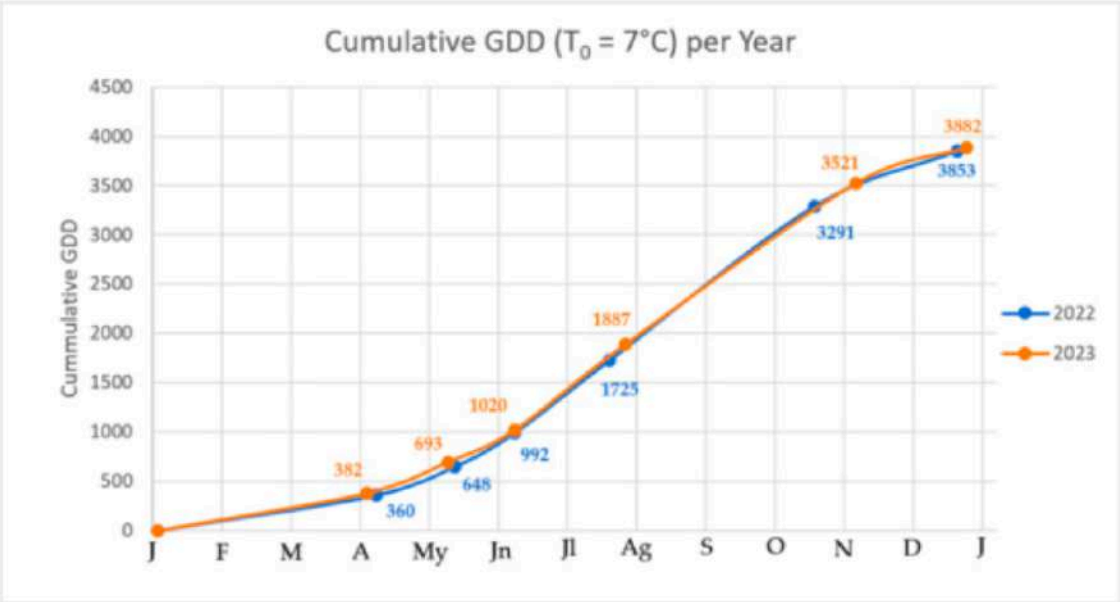
The growth of *Jacaranda mimosifolia* follows several developmental stages. The first stage begins with seed germination, when the embryo emerges and develops into a seedling. During this phase, the young plant establishes its initial root system and produces its first leaves.

The juvenile stage follows, characterized by rapid vegetative growth. Young trees may increase in height quickly during the first few years, especially when grown in favorable conditions with sufficient sunlight and water (Gilman & Watson, 2014).

As the tree matures, growth gradually slows and the canopy expands. Mature trees produce large branching structures and begin regular flowering cycles during late spring or early summer. At this stage, the tree contributes significantly to local ecosystems by providing shade, nectar resources for pollinators, and habitat for various organisms.

The graph below in Figure 29 about the cumulative Growing Degree Days (GDD) illustrates how temperature accumulation throughout the year influences the growth stages of Jacaranda mimosifolia. During the early months of the year, GDD increases slowly, indicating limited heat availability and minimal physiological activity, which corresponds to very slow initial growth. As temperatures rise from mid year onward, the graph shows a steep increase in cumulative GDD, reflecting the period when the jacaranda experiences its most active growth period. This stage supports rapid vegetative development, including leaf expansion, stem elongation, and root establishment. Toward the later months of the year, cumulative GDD continues to increase but at a slower rate, signaling the transition from active growth to reproductive stages such as flowering and seed capsule development. The slightly higher cumulative GDD observed in 2023 compared to 2022 suggests a warmer growing season, which may result in earlier growth and more vigorous development throughout the year.

Figure 29



Phenological stages of *Jacaranda mimosifolia* (MDPI, 2025)
https://www.mdpi.com/2079-7737/14/11/1569#Simple_Summary

4.9 Fruiting and Seed Production

After flowering, fertilized flowers develop into woody seed capsules. These capsules mature gradually over several months before drying and splitting open to release seeds.

Seed production plays an important role in the natural reproduction of the species. A single mature tree can produce hundreds of capsules, each containing many winged seeds adapted for wind dispersal. This reproductive strategy allows the species to spread across suitable habitats and colonize open spaces (Gentry, 1992).

Figure 30

Wood seed capsules of *Jacaranda mimosifolia* (Green Paradise, 2021) GREEN PARADISE® blue jacaranda tree F1 Quality seeds Pack Jacaranda mi – GreenParadiseLive

4.10 Harvesting Seeds

Seed harvesting is commonly performed when capsules turn brown and begin to dry on the tree. At this stage, the seeds inside have reached full maturity and are capable of germination. Harvested capsules are usually dried further in a well ventilated environment until they open naturally. The seeds can then be collected and stored in sealed containers to maintain viability. Although *J. mimosifolia* seeds can remain viable for several months, planting them soon after collection often produces the best germination results (World Agroforestry, 2024).

Figure 31

Wooden seed capsules of *Jacaranda mimosifolia* (Monaco Nature Encyclopedia, 2020)
https://www.monaconatureencyclopedia.com/jacaranda-mimosifolia/?lang=es

4.11 Pruning and Re-Planting

Pruning is an important management practice that helps maintain tree structure and safety. Young trees often require structural pruning to encourage a strong central trunk and balanced branching pattern. Without proper pruning, branches may develop weak angles that increase the risk of breakage during storms (Gilman & Watson, 2014).

Figure 32

Correct way to prune a *Jacaranda mimosifolia* (WikiHow, 2025)
https://www.wikihow.com/Grow-a-Jacaranda-Tree

Mature trees may also require occasional pruning to remove dead or damaged branches and to maintain clearance in urban environments such as streets and sidewalks. Pruning is generally performed during periods of lower growth activity, meaning late autumn and winter, to minimize stress on the tree.

In cases where trees must be relocated, re planting should be done carefully to preserve as much of the root system as possible. Newly transplanted trees require additional watering and monitoring until they re establish in the soil.

4.12 Management of Pests and Diseases

Although *Jacaranda mimosifolia* is generally considered a hardy species, several pests and diseases can affect its health under unfavorable conditions. Sap-feeding insects such as whiteflies

may infest leaves and stems, weakening the tree by removing nutrients from plant tissues (Gilman & Watson, 2014).

Figure 33

Sap sucking insects effect on leaves (Tallahassee Democrats, 2021)
https://www.tallahassee.com/story/life/home-garden/2021/05/20/sap-sucking-scale-insects-can-damage-ornamentals/5182816001/

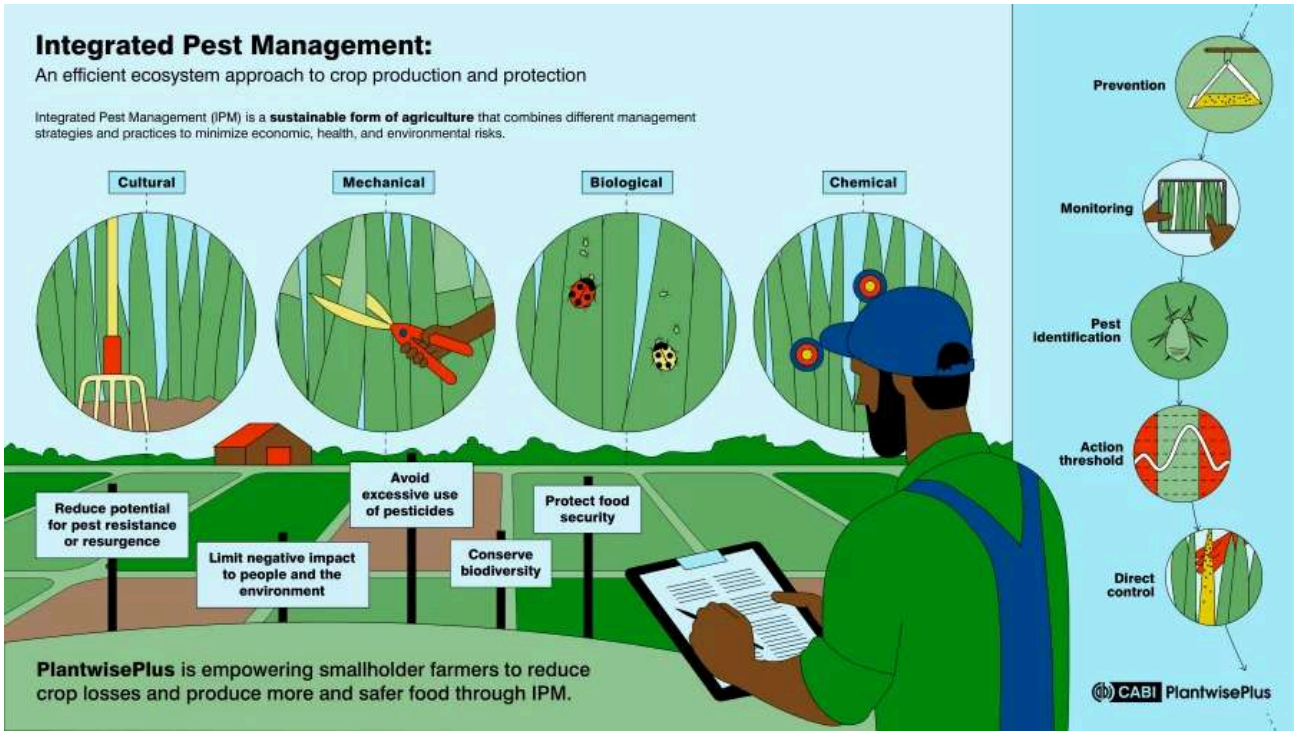
Another potential pest is the polyphagous shot-hole borer, which can damage branches and introduce fungal pathogens into the tree. In addition, poorly drained soils can promote root rot diseases caused by soil borne fungi.

Regular monitoring of tree health is essential for early detection of pest infestations or disease symptoms. Maintaining proper soil drainage, avoiding excessive watering, and promoting good air circulation around the canopy can significantly reduce disease risks (Gilman & Watson, 2014).

4.13 Pest and Disease Control

Effective pest and disease control relies on integrated management strategies rather than relying solely on chemical treatments. Cultural practices such as proper watering, balanced fertilization, and pruning of infected branches can significantly reduce past populations and diseases spread. Biological control methods may also be used, including encouraging natural predators that feed on insect pests, such as lady bugs. In severe cases, horticultural oils such as neem oil or insecticidal soaps based on potassium salts may be applied carefully to control infestations.

Figure 34



Ways to manage pests that affect Jacaranda trees (BioProtection Portal, 2023)
https://bioprotectionportal.com/resources/integrated-pest-management-use-and-its-benefits/

Preventative management is usually the most effective approach, as healthy trees are more resistant to both pests and diseases. By maintaining favorable growing conditions, growers can reduce the likelihood of serious damage to *Jacaranda mimosifolia* trees.

Chapter 4 Conclusion

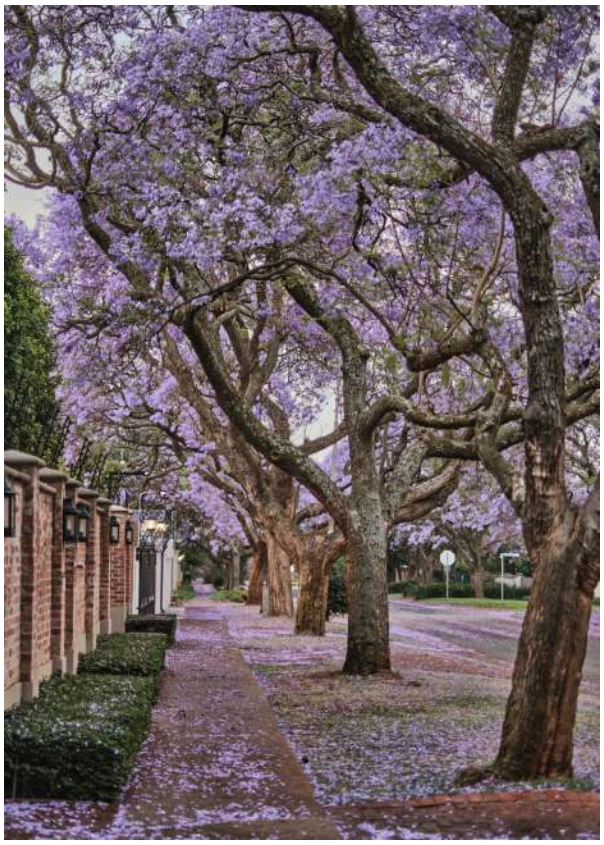
The cultivation and management of *Jacaranda mimosifolia* requires a combination of ecological understanding and practical horticultural techniques. Natural regeneration through seed dispersal allows the species to reproduce in open habitats, while nursery propagation and vegetative methods provide reliable ways to produce planting stock for urban and agricultural landscapes. Successful cultivation depends on providing suitable environmental conditions, including well drained soil, full sunlight, and moderate moisture. Management practices such as fertilization, pruning, and monitoring for pests help maintain healthy growth and strong structural development. Although the species can be affected by certain insects and fungal pathogens, proper cultural management greatly reduces these risks.

Chapter 5.0 Importance, Markets, and Uses

5.1 National, Regional, and International Importance

Jacaranda mimosifolia is valued primarily as an ornamental and horticultural species rather than as a traditional food or industrial crop. Its attractive violet blooms and resilience in warm and subtropical climates make it a widespread choice for urban plantings, parks, private gardens, and street alignments around the world. In cities like Pretoria, South Africa (known as the Jacaranda City), tens of thousands of these trees contribute to cultural identity and aesthetic appeal, making the tree both a botanical landmark and a tourist draw during flowering months. The species is cultivated outside its native South American range in locations across Europe, North America, Africa, Asia, and Australia, showing its broad regional and international horticultural relevance. Although exact global economic figures are not compiled in commodity databases because jacaranda is not a staple export crop like coffee or soy, the trees' ornamental value intersects with urban tourism, real estate enhancement, and nursery sales markets, all of which contribute significantly to local and regional economies.

Figure 35



Urban street planting Pretoria South Africa *Jacaranda mimosifolia* (Pretoria- Beautiful Jacanda Tree-Covered streets, 2026) https://humbo.com/za/pretoria

5.2 Value as a Traded Crop

Unlike traditional crash crops, *Jacaranda mimosifolia* is traded mostly through horticultural nurseries selling trees and seeds rather than through large commodity markets. Reliable economic data at regional nursery scales show that jacaranda commanded one of the highest economic values within ornamental nursery species in Thailand's Bignoniaceae commercial cultivation, nearly matching the top-earning ornamental species in that region (see table 2), illustrating strong localized market value when priced per pot sold and sales volume combines (Chayuttri et al., 2025).

Figure 36

Jacaranda mimosifolia nursery pot commercial ornamental tree production (Kilby Park Tree Farm, n.d.) https://www.kilbytreefarm.com.au/product/jacaranda-mimosifolia/

Table 2 Relative Economic Value of *Jacaranda mimosifolia* in Bignoniaceae Nursery Trade (Thailand)

Species	**Approximate Annual Value (THB)**
Dolichandrone serrulata	138,000
Jacaranda mimosifolia	135,000
Crescentia alata	105,000
Tecoma stans cv.	96,985

Note: Data based on economic contributions from retail prices and sales volume, information taken from Horticulturae (MDPI) (Chayuttri et al., 2025).

Another indication of trade value comes from Export Data, such as a Colombian nursery/exporter profile where individualized trade records show that this company alone exported over USD 1.7 million worth of ornamental plant products, including live plants and foliage classified under relevant trade codes over several years (Trademo, 2026). While this includes multiple ornamental products, it highlights that significant export volumes and value can be associated with ornamental tree trade (Trademo, 2026). Collectively, multiple small nursery exporters operating worldwide established jacaranda as a valuable, albeit decentralized, traded horticultural crop.

5.3 Production and Major Producing Regions

Because *Jacaranda mimosifolia* does not have centralized global production figures like staple crops, production must be considered through nursery supply and regional horticultural markets.

Figure 37

Large scale ornamental tree nursery export Asia jacaranda (Victory Nursery, 2026) https://victorynursery.us/products/jacaranda-mimosifolia?srsltid=AfmBOoqt9xfXY7P7fiEyqs2u-vq1XCNxg72gPWxgmagRDwr32ofw8G0M

Sale nurseries, like the ones in China, report the capacity to supply 10,000+ jacaranda plants per year from production bases specializing in ornamental tree propagation for export markets (Greenworld Nursery, 2025). Prices for exported plants can range from modest retail values for small nursery stock to hundreds of dollars per mature tree, depending on size and market region (Alibaba sourcing guide, 2026). In Spain and the European Union, for example, medium-large

nursery specimens often sell between €60–€300 per tree, reflecting a strong domestic market price range (Alibaba sourcing guide, 2026). These figures, although heterogeneous, illustrate that nursery production and supply networks for jacaranda operate globally, with China, Europe, and the Americas hosting some of the most active suppliers.

5.4 Market Characteristics: Producers and Trade Dynamics

The market for *Jacaranda mimosifolia* is characterized by many small to medium producers rather than a few large multinational corporations. Nurseries in different countries grow, sell, and export jacaranda saplings, responding to regional landscaping demand and climatic suitability. Because the species is primarily ornamental and not a bulk commodity, producers operate at the regional and local level, supplying landscapers, municipalities, garden centers, and private buyers. Prices vary widely depending on plant size, form (grafted vs seedling), and destination market, suggesting a fragmented and diverse market structure rather than a concentrated one dominated by a few players. Many producers cater to both national and international markets, with some nurseries exporting significant volumes (as shown in export data), while local dealers serve domestic landscaping projects.

5.5 Products and Value-Added Uses

Although *Jacaranda mimosifolia* is most widely valued as a raw ornamental plant, several value-added uses and derivative products exist:

- Ornamental landscapes: sale of live trees for gardens, parks, and urban streetscapes (primary product).

- Seeds: retail packets marketed internationally for gardening and landscaping use (online retailers offer multiple seed pack size options).
- Wood and craft materials: while not a major industrial timber, the wood is sometimes used in cabinetry, artisanal woodworking, and craft products, due to its light texture and workability.
- Honey and pollination services: jacaranda blossoms attract pollinators, supporting honey production in apiary systems where these services add indirect economic value.

Figure 38

Jacaranda hand carved wood trinket bowl (Kanju Interiors, 2026)
https://kanjuinteriors.com/products/organic-jarcanda-wood-bowls?srsltid=AfmBOopEWhhaOGVDj4DQ5ZTDtqi2KPe4CfcMe4NOg5wGIcnqELmv2SO

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