Phenological Markers - Bay Rum (Pimenta racemosa)

Despite being evergreen and not showing dramatic seasonal changes like leaf drop, **Bay Rum does go through discernible phases** in its life cycle that can be recorded:

1. Flowering Periods

- **Flowering is seasonal**, often triggered by rainfall or humidity cycles.
- The small, white-to-greenish flowers are fragrant and usually appear in **clusters** in leaf axils.
- In St. Croix and other Caribbean areas, flowering is often observed in **late spring to early summer**, though it can vary based on microclimate.

Observation tips:

- Note the *first appearance of buds*.
- Track *peak bloom* and *flower longevity*.
- Document whether flowering occurs more than once per year.

2. Fruiting / Seed Development

- After flowering, Bay Rum produces **small, dark purple berries** that resemble peppercorns.
- These fruits usually follow shortly after flowering—look for them within **a month or so post-bloom**.
- Fruit development can be gradual and varies in abundance year to year.

Observation tips:

- Track *fruit set* (how many flowers actually develop into fruit).
- Document *fruit color change* from green to deep purple or black.
- Note *fruit drop timing* and whether birds or insects are actively feeding on them.

3. Leaf Flush and Growth Spurts

- Although evergreen, Bay Rum can exhibit **leaf flushes**—periods of new leaf growth.
- New leaves may be lighter green or slightly reddish before maturing.
- These flushes may align with **rainy seasons or post-pruning responses**.

Observation tips:

- Watch for *synchronized bud breaks* or *clusters of new leaves*.

- Photograph *color and texture differences* between new and mature foliage.

4. Aromatic Intensity or Leaf Oil Production (less visual, more experimental)

- While this isn't a typical phenology trait, the **aromatic intensity** of the leaves may change slightly with climate or moisture levels.
- If integrated with a broader study, this might correlate with **essential oil potency** during certain seasons.

Phenological Markers – Wild Almond (*Sterculia foetida*)

1. Leaf Behavior

Sterculia foetida is **deciduous**, typically shedding its leaves during the **dry season**.

- Leaves are **palmately compound**, usually with **5–9 oblong leaflets** arranged like fingers on a hand.
- Leaf drop occurs **between January and March**, often **preceding flowering**.
- **New leaf flushes** emerge quickly with rainfall or seasonal shifts, typically in **March–April**.

Observation Tips:

- Watch for **complete canopy loss** during dry months.
- Record the **first appearance of new leaflets**, noting their bronze or reddish-green hue.

2. Flowering

Flowers are **small, reddish to purplish**, and borne in **loose clusters at the branch tips**.

- They are **unisexual**, and both **male and female flowers** are found on the same tree.
- The flowers may emit a **strong, unpleasant odor**, particularly in the early blooming stages.
- Flowering begins **just before or during leaf flush**, usually **March to May**.

Observation Tips:

- Track **emergence of flower clusters** on leafless or newly flushing branches.
- Note any **odor** and its correlation with flower maturity.
- Observe **pollinator visits**, especially flies and beetles.

3. Fruiting

The fruit is a **large, woody, star-shaped capsule**, usually with **5 segments** that split open when mature.

- Inside each follicle are **several smooth, black seeds**—these resemble almonds in shape but are **inedible raw** and potentially **toxic**.
- Fruits mature from **May to July**, and the seeds are sometimes roasted in traditional settings after detoxification.

Observation Tips:

- Document **fruit development**, including **capsule size, color change, and opening**.
- Note **seed exposure** and **animal interaction**—some birds may investigate them, though few consume them.

4. Growth Habit

This species grows as a **tall, fast-growing deciduous tree**, reaching **60–100 feet** in favorable conditions.

- The trunk is often **straight and branch-free for many feet**, topped by a **rounded to spreading canopy**.
- Commonly found in **dry coastal forests** or planted as an **ornamental or shade tree** in tropical regions.

5. Seasonal Pattern (St. Croix)

- **Jan–Mar**: Complete or partial leaf drop
- **Mar–May**: Flowering and new leaf emergence
- **May–Jul**: Fruit maturation and seed exposure
- **Aug–Dec**: Canopy fully leafed; rest phase or occasional light flowering

Phenological Markers -Sandbox Tree (*Hura crepitans*)

1. Flowering

The Sandbox Tree is monoecious (having separate male and female flowers on the same tree), and its flowering is quite distinct.

- **Male flowers**: Tiny, red, and borne on long spikes; often appear in clusters.
- **Female flowers**: Larger, solitary, and found near the ends of branches.
- Flowering is **often seasonal**, triggered by changes in rainfall or dry-to-wet transitions.

Observation tips:

- Record the **first appearance of male and female flowers**—they are visually quite different.
- Track **peak flowering** and note if male and female flowering periods overlap.
- Observe and photograph **insect or bird activity**, which may aid in pollination.

2. Fruit Development (and Explosive Dispersal)

This is perhaps the most striking feature of the Sandbox Tree:

- After successful pollination, large, ridged capsules (fruit) begin to form.
- These fruits **mature over several weeks to months**, becoming hard and woody.
- When dry, they **explode with a loud crack**, dispersing seeds at high speed—sometimes up to 100 feet away.

Observation tips:

- Record **fruit set** after flowering—how many capsules form and their size.
- Track **maturation**: green → brown/dry.
- Note and (if safe) photograph **exploded fruit husks** on the ground to track dispersal timing.

⚠️ *Caution: Mature fruits can explode with considerable force. Avoid close handling during late stages of drying.*

3. Leaf Flush and Drop

Though it's generally **deciduous or semi-deciduous** depending on rainfall, the Sandbox Tree often shows **leaf drop prior to flowering or in dry seasons**.

- Leaf drop may be partial or complete.
- New leaf flush typically follows shortly after flowering or rain.

Observation tips:

- Track **leaf yellowing and fall** (partial or full).
- Record **timing of new leaf emergence**—new leaves are bright green and often shiny.
- Compare foliage density at monthly intervals.

4. Bark and Defensive Features

While not a phenophase, the **thorn-covered bark** is a year-round feature that may show variation in **epiphyte or lichen coverage** with seasonal moisture.

Observation tips:

- Photograph bark regularly to track **lichen growth or moss coverage** as environmental indicators.

Phenological Markers - Turpentine Tree (*Bursera simaruba*)

1. Leaf Drop and Leaf Flush

Although often labeled as “evergreen,” *Bursera simaruba* is actually **deciduous or semi-deciduous**, especially in response to **dry-season stress**.

- Trees may **lose most or all of their leaves** during prolonged dry periods.
- **Leaf flush** typically follows the **first significant rains** or shift into the wet season.
- New leaves emerge quickly and are soft, bright green, and compound.

Observation tips:

- Record **first signs of leaf yellowing or browning**.
- Track **peak defoliation** (if full leaf drop occurs).
- Note **first appearance of new leaflets** and duration of full canopy recovery.

*In St. Croix, you may see **partial defoliation** during the drier months (Dec–Apr) and flushes beginning around **May or June**, depending on rainfall.*

2. Flowering

Flowers are **small, greenish-white**, and grow in **clusters** (inflorescences). While not showy, they are **important phenological indicators**.

- Flowering tends to occur **before or just after the onset of new leaves**.
- This often happens in the **transition between dry and wet seasons**.

Observation tips:

- Watch for **inflorescence development** on bare or newly leafed branches.
- Document **first bloom, peak bloom, and end of flowering**.
- Note **insect activity**, as flowers attract bees and small pollinators.

3. Fruit Development

Fruits are **small, dry drupes**—oval and about the size of a small grape—often with **red or orange coloring** when mature.

- Fruiting follows flowering and may **overlap with new leaf growth**.
- Mature fruits typically **split open** to expose a **single black seed**, often with a red aril, attracting birds.

Observation tips:

- Track **fruit set**, noting early vs. mature stages.
- Record **fruit color change** and seed exposure.
- Observe **fruit drop or removal by wildlife** (especially birds like tanagers or thrashers).

4. Bark Behavior and Lichen/Epiphytes

The **red, papery bark** peels year-round but may **intensify during growth spurts** or following rainfall. Bark surfaces are often host to **lichens and mosses**, which can show seasonal variation.

Observation tips:

- Note **changes in bark exfoliation** (increase/decrease).
- Photograph bark monthly to monitor **lichen or moss density** as a microclimate indicator.

Phenological Markers – Banyan Tree (*Ficus benghalensis*)

1. Leaf Flush
Banyan trees are **evergreen** in tropical climates like St. Croix but may exhibit **mild seasonal leaf turnover** or semi-deciduous behavior during dry spells.

- New leaf flushes occur periodically and are often triggered by **rainfall or pruning**.
- **New leaves** are lighter green and tender, sometimes with a slightly reddish hue.
- These flushes help mark growth cycles, even in the absence of full leaf drop.

2. Leaf Drop (Minor or Cyclical)
While not truly deciduous, the tree may shed some older leaves during **dry periods** or before a flush.

- Watch for a subtle **increase in leaf litter** beneath the tree as a precursor to new growth.

3. Syconia Development (Fig-Like Fruit)
Like all *Ficus* species, the Banyan produces **syconia**—enclosed fig-like structures that house internal flowers.

- These appear as small **green, reddish, or purplish nodules** on twigs and branchlets.
- They may appear **multiple times a year**, but fruiting is often **asynchronous**—not all figs on the tree mature at the same time.
- Fruiting is often linked with **increased pollinator activity**, especially fig wasps, birds, and bats.

4. Rooting Behavior (Aerial Roots)
Though not traditionally a phenological marker, **aerial root production** can increase during **wet seasons** or periods of high humidity.

- Roots grow down from limbs and can eventually anchor in the soil, expanding the tree's footprint.
- Monitoring aerial root formation may reflect **moisture conditions** and tree maturity.

5. Wildlife Interaction
Syconia attract **fruit bats, birds, and small mammals**—observing feeding behavior can help pinpoint fruiting periods.

- Because figs ripen intermittently, **repeated visits** are key to identifying active phenophases.

Phenological Markers – Cannonball Tree (*Couroupita guianensis*)

1. Flowering

This tree is famous for its **spectacular, fragrant flowers**, which grow in long, hanging racemes directly from the trunk or large branches—a botanical phenomenon known as **cauliflory**.

- In tropical climates like St. Croix, flowering can occur **throughout the year**, but may **peak in the dry season or early wet season** (approx. **February–June**).
- Flowers are large (4–6 inches wide), waxy, and pink-to-red with yellow and white staminal structures.
- They are **pollinated by bees**, especially large ones like carpenter bees.

Observation Tips:

- Track **first appearance of buds**, peak bloom periods, and **length of raceme growth**.
- Note **fragrance intensity** and pollinator presence (usually strongest early in the day).
- Flowering may continue even while fruit is still developing.

2. Fruiting

The tree produces **large, spherical fruits** (up to 10 inches in diameter) that resemble cannonballs—hence the name.

- Fruits develop **directly on the trunk** and can take **up to a year to mature**.
- They contain **numerous seeds embedded in a foul-smelling pulp** that attracts animals like peccaries or bats (if present).

Observation Tips:

- Document the **size and development stage** of fruits (green → brown → cracked or fallen).
- Note any fruit drop, which usually occurs after long maturation.
- Use caution—**falling fruit can be hazardous** due to size and weight.

3. Leaf Behavior

The tree is **evergreen**, but it may show **leaf turnover** in response to seasonal shifts.

- New leaves are typically **lighter green and soft** before maturing.
- Mild **leaf drop** may precede flowering or be triggered by stress.

4. Cauliflorous Growth Pattern
Both flowers and fruits appear directly from the **trunk and large limbs**, making phenological changes easy to observe up close.

- Track **emergence and extension of flowering racemes** over time.

Phenological Markers – Sausage Tree (*Kigelia africana*)

1. Flowering

The Sausage Tree produces **large, dark red to maroon bell-shaped flowers**, which hang from **long, rope-like stalks (peduncles)**. These inflorescences often dangle **well below the canopy**, making them highly visible.

- In St. Croix's climate, flowering typically peaks during the **dry season to early wet season**, often **March to June**.
- Flowers **open at night** and are **pollinated by bats** and large insects—though daytime visitors like bees may also be seen.
- Flowers are **short-lived**, often falling to the ground within a day.

Observation Tips:

- Track **initial stalk emergence**, flower bud development, and **flower drop timing**.
- Note **pollinator activity**, especially around dusk or early morning.
- Watch for **flower litter** beneath the tree as an indicator of active blooming.

2. Fruiting

Following pollination, the tree develops **massive, sausage-shaped fruits** (12–24 inches long, 10+ lbs), which hang from the same long stalks.

- Fruit development is **slow and extended**, often taking **up to a year** to reach maturity.
- Mature fruits are **woody and gray-brown**, often left hanging for months or until dropped by wind or decay.

Observation Tips:

- Document **fruit length and surface changes** (smooth green to coarse brown).
- Use caution—**mature fruits can be dangerous if they fall unexpectedly**.
- Note any **fruit drop, cracking, or wildlife interaction**.

3. Leaf Behavior

The Sausage Tree is **semi-deciduous**, sometimes shedding part or all of its leaves during **dry periods**, particularly **before flowering**.

- **New leaves** emerge with flowering or shortly thereafter and are compound, with 3–7 leaflets.
- Leaf flush is often **synchronized**, producing a refreshed green canopy.

4. Cauliflorous Traits
While not as strictly cauliflorous as the Cannonball Tree, **flowers and fruits are borne on long pendulous stalks** that hang conspicuously from the main branches.

Phenological Markers – Trumpetwood (*Cecropia schreberiana*)

1. Leaf Behavior

Cecropia schreberiana is **deciduous to semi-deciduous**, particularly in the **dry season**.

- Leaves are **large, palmately lobed** (like a hand with outstretched fingers), with **9–11 lobes** and **silvery undersides**.
- Leaf drop typically occurs **January–March**, followed by **rapid leaf regrowth** with the first rains.

Observation Tips:

- Look for **near-total canopy loss** at peak dry season.
- Monitor for **new flushes of large, light green leaves** beginning **late March to April**.

2. Flowering

Flowers are **tiny and unisexual**, borne in **cylindrical spikes** on separate male and female trees (*dioecious*).

- Flowering occurs **soon after leaf emergence**, typically **April–June**.
- The flowers are **wind-pollinated**, not showy, and easily missed without close observation.

Observation Tips:

- Check **male trees** for **upright catkin-like spikes**, and **female trees** for more robust **fruiting structures** forming shortly after pollination.
- Document **first appearance of flower spikes** post leaf flush.

3. Fruiting

Female trees produce **multiple-seeded, club-shaped fruits**, which are **fleshy and sweet**, attracting **birds and bats**.

- Fruit ripens **June–August**, depending on rainfall and elevation.
- Fruiting is frequent and helps the species **spread aggressively in disturbed areas**.

Observation Tips:

- Track **fruit maturation and drop**.
- Observe **wildlife interaction**, particularly frugivorous birds.

4. Growth Habit
C. schreberiana is a **fast-growing pioneer tree**, typically **30–50 feet tall**, with a **hollow trunk** that hosts ants in its native range (mutualism with *Azteca* ants is less prominent in the Caribbean).

- Common in **forest edges, roadsides, and secondary growth zones**, it plays a key role in **forest regeneration**.

5. Seasonal Pattern (St. Croix)

- **Jan–Mar**: Leaf drop and dormancy
- **Apr–Jun**: New leaves, flowering
- **Jun–Aug**: Fruiting
- **Sep–Dec**: Full canopy, occasional leaf cycling

Phenological Markers – Pink Cedar (*Tabebuia heterophylla*)

1. Leaf Drop (Deciduous Behavior)
Tabebuia heterophylla is **deciduous**, often shedding most or all of its leaves in the **dry season**—typically **January to March** in St. Croix.

- Leaf drop is usually **timed to precede flowering**, leaving the tree mostly bare.
- This leafless stage enhances the visual impact of the flowers.

2. Flowering
Flowering is the tree's most striking phenophase. Large, **trumpet-shaped pink to pale lavender flowers** bloom in abundance, often **covering the bare branches**.

- Flowering usually occurs in **late dry season (February–April)**.
- Flowering may begin **before any new leaves appear**, producing a spectacular floral display.
- Flowers may fall off quickly, creating **a carpet of pink beneath the tree**.

3. Leaf Flush (New Growth)
After flowering, the tree enters a period of **leaf flush**, producing **simple, ovate green leaves**.

- Leaves emerge **as flowering declines**—usually **April through May**.
- New leaves may appear slightly bronze before maturing to green.

4. Fruiting
The tree produces **long, slender seed pods**, often **10–15 inches** long, which develop **after flowering**.

- Pods mature through late spring and early summer (**May–July**).
- When ripe, the pods **split open** to release numerous **flat, winged seeds**, dispersed by wind.

5. Seasonal Synchrony
This tree displays **strong seasonal cues**:

- **Bare branches → Mass flowering → Leaf flush → Pod development → Seed dispersal**

Observation Tips:

- Note **leafless phase timing** each year to anticipate flowering.
- Photograph **first flower appearance, peak bloom, and flower fall**.

- Document **pod growth and seed dispersal**—especially if windblown seeds accumulate in nearby areas.

Phenological Markers – Hogplum Tree (*Spondias mombin*)

1. Leaf Drop (Deciduous Behavior)
Hogplum is a **deciduous** tree that typically sheds its leaves during the **dry season**, especially in areas with marked rainfall variation like St. Croix.

- Leaf drop commonly occurs between **December and March**, and is usually **complete or near-complete**.
- The tree may remain bare for several weeks, with flowering sometimes beginning during this leafless phase.

2. Flowering
Small, **white to greenish flowers** appear in large, branched inflorescences at the **ends of twigs**.

- Flowering typically begins **at the end of the dry season**, often in **March or April**, sometimes while the tree is still leafless.
- Flowers are **fragrant and attractive to bees and other pollinators**.

3. Leaf Flush (New Growth)
Following flowering or alongside it, the tree produces **new compound leaves** with 5–19 leaflets.

- Leaf flush is **rapid and synchronized**, restoring full canopy coverage by early to mid wet season (**April–June**).
- New leaves emerge soft and light green, darkening as they mature.

4. Fruiting
The tree bears **oval to oblong fruits**, typically **1–2 inches long**, that ripen from green to **bright yellow or orange**.

- Fruits are produced **mid to late wet season**, with **ripening often occurring between June and August**.
- Ripe fruit may accumulate beneath the tree or be harvested for consumption or use in preserves.

5. Seed Dispersal and Wildlife Interaction
The pulp-covered seeds are dispersed by **gravity, wildlife, and humans**.

- **Fruit drop** may occur in waves depending on weather and maturity.
- Local fauna (birds, bats, pigs, and livestock) often feed on the fruit, aiding dispersal.

Phenological Markers – Breadfruit Tree (*Artocarpus altilis*)

1. Leaf Behavior

Breadfruit is an **evergreen or semi-deciduous tree**, depending on rainfall and soil moisture.

- Leaf drop may occur in **short bursts**, especially during **dry periods**, but is not usually complete.
- **New leaf flushes** occur frequently and are characterized by **large, deeply lobed leaves** that are light green and slightly hairy when young.

Observation Tips:

- Track **leaf color, size, and surface texture** to distinguish new flushes.
- Observe if partial defoliation precedes flowering in your local microclimate.

2. Flowering

The tree is **monoecious**, producing **male and female inflorescences separately** on the same tree.

- **Male flowers** are slender, club-shaped spikes that emerge first.
- **Female flowers** are round, green, and appear shortly after the males on the same branches.
- Flowering may occur **year-round** in St. Croix, but often **peaks during the early wet season (May–July)**.

Observation Tips:

- Document **first emergence** of male and female flowers.
- Note whether male flowering precedes female and by how many days/weeks.
- Look for **insect activity**, as bees may visit both flower types.

3. Fruiting

Female flowers mature into **large, round or oblong fruit**, which can weigh several pounds.

- Fruits take **2–4 months to mature**, ripening to a greenish-yellow or light brown surface.
- Fruiting is typically **cyclical** and may peak once or twice a year, often aligning with rainfall patterns.
- Ripe fruits may **drop to the ground** if not harvested.

Observation Tips:

- Record **fruit set following flowering** and track **growth stage** over weeks.
- Photograph **color and texture changes** as the fruit ripens.
- Observe signs of **fruit drop or animal activity** near fallen fruits.

4. Seasonal Rhythms
While capable of **year-round fruiting**, many breadfruit trees display **semi-seasonal peaks** in fruit production.

- In St. Croix, this may occur **after the first major rains** and again **toward the end of the wet season**, depending on tree maturity and health.

Phenological Markers – Mango Tree (*Mangifera indica*)

1. Flowering

Mango trees produce large, upright **panicles of small, yellowish-white flowers** at the **ends of branches**. These may contain both male and hermaphroditic (bisexual) flowers.

- In St. Croix, **flowering typically begins in late dry season**, around **February to April**, though local microclimates may influence timing.
- Trees often flower **before full leaf flush**, sometimes while still holding dry or sparse foliage.
- Flowering may last **2–4 weeks**, depending on weather and cultivar.

Observation Tips:

- Watch for the emergence of **flower panicles**—they often appear suddenly.
- Note **pollinator activity** (bees and flies are common visitors).
- Track the **transition from flower to fruit set** over time.

2. Fruiting

After successful pollination, fruits begin to develop—starting small and green, eventually **maturing to yellow, red, or greenish hues** depending on the variety.

- Fruits typically **ripen 3–5 months after flowering**.
- In St. Croix, **fruiting season generally peaks between June and August**, though this can vary.

Observation Tips:

- Record **fruit set rate** (only a small percentage of flowers produce fruit).
- Track **size and color changes** of developing mangoes.
- Note **fruit drop timing**—both premature and mature fruits may fall.

3. Leaf Flush

New mango leaves are a distinctive **reddish-bronze or copper** when young, gradually turning green as they mature.

- **Leaf flushes occur several times a year**, often following flowering or fruiting cycles.
- Leaves are typically **lance-shaped and leathery** when mature.

Observation Tips:

- Look for **red-tipped shoots** at branch ends to mark early flush stages.

- Compare **timing of leaf flush vs. flowering**—in some trees, leaf flush may overlap or follow flowering.

4. Leaf Drop
Mango trees are **evergreen**, but they do drop older leaves regularly.

- Increased leaf litter may occur **before flowering**, as the tree reallocates energy to reproductive growth.

5. Seasonal Pattern in St. Croix

- **Late dry season (Feb–Apr)**: Flowering begins
- **Early wet season (May–Jun)**: Fruit development
- **Peak wet season (Jul–Aug)**: Fruit ripening and harvest
- **Late wet season (Sep–Oct)**: Leaf flush and canopy renewal

Phenological Markers – Puerto Rican Hibiscus Tree (*Thespesia grandiflora*)

1. Flowering

The Puerto Rican Hibiscus produces **large, showy flowers**—typically **pink to purplish-lavender**, with a dark maroon throat.

- In St. Croix's tropical climate, *Thespesia grandiflora* may **flower intermittently year-round**, with **increased flowering** during the **early wet season** (**April to July**).
- Flowers open in the morning and may **fade slightly by late afternoon**, but usually last for **a full day**.
- Flowering tends to be **heaviest following leaf flush**, especially after rainfall or pruning.

Observation Tips:

- Record **first bud appearance**, flower opening, and duration.
- Monitor **pollinator activity**, especially bees and butterflies.
- Note whether flowering occurs **solitarily or in bursts**.

2. Fruiting

Fruits develop as **rounded, five-lobed capsules**, each containing **multiple seeds**.

- Capsules **mature over several weeks**, drying to a **brownish, woody texture** before splitting open.
- Fruiting is **sporadic but may follow a major flowering period** in mid to late wet season (**June–September**).

Observation Tips:

- Track **capsule formation and ripening** stage.
- Watch for **seed release** and accumulation beneath the canopy.
- Photograph **opened vs. unopened capsules** to show maturity progression.

3. Leaf Behavior

The tree is **evergreen in tropical conditions**, with only **minor leaf turnover** year-round.

- New leaf flushes are typically triggered by **flowering or pruning**.
- Leaves are **oval to heart-shaped**, glossy, and medium green when mature.

Observation Tips:

- Look for **lighter green flushes** near flowering zones.
- Minimal seasonal leaf drop means **leaf behavior may be a weak phenological indicator**, but **flush after rains or stress recovery** is notable.

4. Seasonal Pattern (St. Croix)

- **Dry to early wet season (Mar–Jun):** Peak flowering
- **Mid wet season (Jul–Sep):** Fruiting, capsule maturity
- **Late wet season (Oct–Nov):** Minor leaf flush or regrowth if pruned

Phenological Markers – Flamboyant Tree (*Delonix regia*)

1. Leaf Drop (Deciduous Behavior)
The Flamboyant Tree is **deciduous**, typically **shedding most or all of its leaves during the dry season**, particularly between **January and March**.

- This **bare phase** often precedes flowering and can last several weeks.
- Some trees may retain a sparse canopy depending on microclimate and rainfall.

2. Flowering
Flamboyant trees produce **large, fiery red to orange flower clusters** (occasionally yellow in rare cultivars) that cover the entire canopy in a spectacular display.

- **Flowering peaks in late dry season to early wet season**, usually **April to June** in St. Croix.
- Flowers emerge on **bare or sparsely leaved branches**, enhancing their visibility.
- Flowering may last **several weeks to over a month**, depending on conditions.

Observation Tips:

- Document **first bud appearance, full bloom, and flower fall**.
- Photograph **tree silhouette during leafless blooming**—a signature phenophase.
- Note pollinator activity—bees and butterflies are frequent visitors.

3. Leaf Flush (New Growth)
After flowering, **delicate, fern-like leaves** emerge quickly, creating a soft green canopy.

- Leaf flush typically begins in **late spring to early summer** (**May–July**).
- New leaves are **light green** and feathery, adding texture to the post-flowering profile.

Observation Tips:

- Track **progression of new leaf emergence** from terminal buds.
- Note whether **leaf flush and fruiting overlap**.

4. Fruiting
Long, **flat, woody seed pods** (up to 24 inches) form after flowering and **hang from branches into the late wet season**.

- Pods start green and turn **dark brown or black** as they mature.
- They may **persist on the tree well into the dry season**.

Observation Tips:

- Record **pod development stages**, especially color change.
- Listen for the sound of **pods rattling in the wind**—often audible during the dry season.
- Note **pod drop** and **seed dispersal activity**, which may be aided by birds or gravity.

5. Seasonal Pattern (St. Croix)

- **Jan–Mar**: Leaf drop
- **Apr–Jun**: Flowering peak
- **May–Jul**: Leaf flush begins
- **Jul–Nov**: Pod maturation and seed dispersal
- **Dec–Jan**: Gradual canopy thinning

Phenological Markers – Kapok Tree (*Ceiba pentandra*)

1. Leaf Drop (Deciduous Behavior)
Kapok trees are **deciduous**, typically shedding their leaves during the **dry season**, especially between **January and March** in St. Croix.

- This **leafless phase** often coincides with or just precedes flowering.
- The massive, buttressed trunk and bare limbs during this time give the tree a dramatic, sculptural look.

Observation Tips:

- Track **start and end of leafless period**.
- Photograph **bare branch structure** to contrast later phenophases.

2. Flowering
Kapok produces **large, creamy-white to pale pink flowers**, rich in nectar and adapted for **bat pollination**.

- Flowering typically occurs during the **late dry season** (**February–April**), often while the tree is still bare.
- Flowers open at night and last only a day or two, with heavy fragrance and copious nectar.
- In some years, flowering is prolific; in others, it may be sparse or skipped altogether.

Observation Tips:

- Monitor for **buds, peak bloom, and flower drop**.
- Note **bat or moth activity** in the evening and early morning.
- Collect fallen flowers for reference and public engagement.

3. Fruiting
Following flowering, **large, green, oval seed capsules** form and mature over several months.

- Capsules split open to release **cottony fibers (kapok) attached to seeds**, aiding in **wind dispersal**.
- Fruiting typically occurs during the **mid to late wet season** (**July–September**).

Observation Tips:

- Watch for **capsule swelling, color change, and splitting**.
- Record **kapok release and dispersal timing**, particularly after rain or wind.

- Fallen fibers can cover the ground or cling to nearby branches.

4. Leaf Flush (New Growth)
New leaf growth begins shortly after flowering or alongside fruiting.

- Leaves are **palmately compound**, with 5–9 leaflets that emerge soft and light green.
- Leaf flush restores the canopy by **late spring to early summer**.

Observation Tips:

- Track **leaf bud swelling, first flush, and canopy density** over time.
- Young leaves may be **bronze-tinged**, becoming glossy green as they mature.

5. Seasonal Pattern (St. Croix)

- **Jan–Mar**: Leaf drop
- **Feb–Apr**: Flowering
- **Apr–Jun**: Leaf flush begins
- **Jul–Sep**: Fruiting, kapok dispersal
- **Oct–Dec**: Full canopy

Phenological Markers – Calabash Tree (*Crescentia cujete*)

1. Flowering

The Calabash Tree produces **greenish-yellow to purplish, bell-shaped flowers**, often with dark veining and a slightly waxy texture. What makes it especially unique is its **cauliflorous habit**:

- **Flowers grow directly from the trunk and larger branches**, not the outer canopy.
- Flowering can occur **throughout the year** in tropical climates, but it may **peak during the late dry to early wet season** (**March–May**) in St. Croix.
- Flowers are **bat-pollinated**, opening in the late afternoon or early evening and lasting only a day.

Observation Tips:

- Look closely at the **trunk and main limbs** for buds and blossoms.
- Record **time of day flowers appear and wither**.
- Observe and note any **pollinator activity at dusk or dawn**.

2. Fruiting

After flowering, the tree develops large, **round, hard-shelled fruits** (gourds), often **6–10 inches in diameter**.

- Fruits develop **slowly** and may remain on the tree for **6–9 months** before maturing.
- The hard shells are **green when immature**, becoming **brownish and woody** as they ripen.
- Fruits do not split open; instead, they are **dispersed by gravity** or harvested by humans for use in utensils, crafts, or containers.

Observation Tips:

- Track **fruit size, surface texture, and color over time**.
- Note **hanging duration**—some trees carry fruit almost year-round.
- Fallen gourds may remain intact for weeks and are slow to decompose.

3. Leaf Behavior

Leaves are **simple, oblong, and bright green**, often arranged in small clusters along branches.

- The Calabash Tree is **semi-deciduous**, sometimes shedding older leaves during the **dry season**.

- **Leaf flushes** follow flowering and fruit set, with young leaves appearing more delicate and lighter in color.

Observation Tips:

- Document **leaf drop in late dry season**, especially during flowering.
- Note **new growth** around the time of fruit development or early rains.

4. Seasonal Pattern (St. Croix)

- **Jan–Mar**: Occasional leaf drop
- **Mar–May**: Peak flowering
- **Apr–Jul**: New leaf flush + early fruit formation
- **Jul–Dec**: Fruit development and hanging phase
- **Year-round**: Sporadic flowering and fruiting may occur in mature trees

Phenological Marker Page: Portlandia grandiflora (Portlandia Tree)

Scientific Name: Portlandia grandiflora
Common Names: Portlandia, Portlandia tree, Wild Allspice, Portlandia flower
Family: Gentianaceae
Native Range: Tropical regions of Central and South America (especially Panama and Costa Rica)
Habitat: Rainforests, tropical and subtropical regions

Tree Characteristics:

- **Height:** Typically grows up to 10-20 meters tall
- **Leaves:** Large, glossy, and leathery, with a pointed shape, arranged opposite on the branches
- **Flowers:** Large, white to creamy flowers with a pleasant fragrance, usually blooming in clusters
- **Fruit:** Green, small, and spherical, turning brown as it matures

Phenological Markers

Spring:

- **New Growth:** Emergence of new leaves, typically starting in early spring. The young leaves are soft, bright green, and more tender than mature leaves.
- **Flower Buds:** Flower buds begin forming in late spring, preparing for blooming in the coming months.

Summer:

- **Flowering Period:** Flowers bloom in mid to late summer. The large white flowers have a distinct, pleasant fragrance that attracts pollinators, particularly bees and butterflies.
- **Pollination:** As flowers open, pollinators are active, contributing to the spread of pollen across the tree's blossoms.
- **Leaf Growth:** Leaves mature during this period, becoming darker and tougher as they harden off from the spring’s tender growth.

Fall:

- **Fruiting:** Fruit begins to develop in early fall, transitioning from green to brown as it ripens. While the fruit is small, it plays a crucial role in seed dispersal.
- **Leaf Drop:** A moderate amount of leaf drop occurs as the tree prepares for the winter months, but it remains relatively evergreen in milder climates.

Winter:

- **Dormancy:** In regions with colder temperatures, the tree enters a state of dormancy. While tropical regions may keep their foliage year-round, in slightly cooler climates, leaf loss can increase, and the tree rests until spring.
- **Seed Dispersal:** As the fruit matures, seeds are dispersed by local wildlife, particularly birds that feed on the fruit.

Observation Tips:

- **Flowering Time:** Keep an eye out for blooming flowers, especially in areas with tropical climates. The fragrant white blossoms are often a sign of a healthy tree.
- **Fruit Maturation:** Watch the fruit change from green to brown in late summer and fall.
- **Leaf Changes:** The leaves of *Portlandia grandiflora* will often show visible signs of wear and tear after flowering. Observing their gradual transition to a harder texture can help track the tree's health and growth cycle.

Environmental Notes:

- *Portlandia grandiflora* prefers consistently humid, tropical environments. It is typically found in the understory of rainforests, where it thrives in partial shade.
- Its fragrant flowers make it a critical component in the pollination networks of tropical ecosystems.

Notable Uses:

- **Cultural Significance:** In some regions, the tree is appreciated for its beauty and aromatic flowers, often planted in botanical gardens and used for ornamental purposes.
- **Medicinal Uses:** The tree has been traditionally used for its medicinal properties in some cultures, although it's not as widely known in the commercial herbal market.

Phenological Markers – Yellow Poinciana (*Peltophorum pterocarpum*)

1. Leaf Behavior
This tree is **deciduous to semi-deciduous**, often shedding its **bipinnate, feathery leaves** during the **dry season**.

- In St. Croix, leaf drop commonly occurs between **January and March**, either partially or entirely.
- **New leaf flush** often follows the first rains or occurs alongside flowering.

Observation Tips:

- Watch for **yellowing and leaf fall** as an early seasonal cue.
- **New foliage emerges** light green and soft, turning darker with maturity.

2. Flowering
Flowering is the tree's most spectacular phase. It produces **dense, upright panicles** of bright **yellow, ruffled flowers**, often **12–18 inches long**, rising above the canopy.

- Flowering typically occurs in the **late dry to early wet season** (**March to June**) in St. Croix.
- Flowers are **lightly fragrant** and attract **bees and butterflies**.
- Trees may flower while still leafless or with partial canopy.

Observation Tips:

- Record **first bud appearance, peak bloom, and duration of flowering**.
- Photograph **crown silhouette against the sky** during peak bloom.
- Track **pollinator visitation**, especially during morning hours.

3. Fruiting
Following flowering, the tree produces **flat, oblong seed pods**, about **3–4 inches long**, that turn from **green to reddish-brown or dark brown**.

- Fruiting begins in **late spring to early summer** and may extend through **late wet season**.
- Pods persist on the tree and may be **slow to drop**, often remaining through the dry season.

Observation Tips:

- Note **pod development and color transition**.
- Check for **pod drop and seed dispersal** under the tree, especially after wind or rain.

4. Seasonal Pattern (St. Croix)

- **Jan–Mar**: Leaf drop
- **Mar–May**: Flowering (can overlap with early leaf flush)
- **May–Jul**: Leaf flush and fruit set
- **Jul–Nov**: Pod ripening
- **Nov–Dec**: Pod persistence or slow drop

Phenological Markers – Rainbow Eucalyptus (*Eucalyptus deglupta*)

1. Leaf Behavior
Rainbow Eucalyptus is **evergreen**, retaining its leaves year-round in tropical climates like St. Croix.

- Leaves are **long, lance-shaped**, and arranged alternately along smooth, rounded branches.
- While individual leaves may yellow and fall periodically, there is **no synchronized leaf drop**.
- New leaf growth can occur **intermittently**, especially after rain or pruning.

Observation Tips:

- Track **new leaf flushes**, which may appear slightly lighter green.
- Minimal seasonal leaf variation makes **bark observation more useful** than foliage for phenology.

2. Bark Shedding (Key Visual Marker)
The most notable phenological trait of this species is its **regular exfoliation of bark**.

- Outer bark peels away in **thin, papery strips**, revealing underlying layers in **bright green, blue, purple, orange, and maroon**.
- Bark shedding occurs **continuously but unevenly**, resulting in a **mosaic of shifting colors**.
- Rainfall and tree vigor influence the **rate and extent of shedding**.

Observation Tips:

- Track **timing and location** of bark peeling—some trunks may peel more heavily at certain times.
- Photograph **color transitions and patch patterns**, especially after rains.

3. Flowering
Small, creamy-white flowers appear in **clusters (umbels)** and are rich in nectar.

- Flowering may occur **sporadically year-round**, but in St. Croix may show **peaks during wetter months** (**May–October**).
- Flowers are **less conspicuous** than other features, often hidden among foliage.

Observation Tips:

- Look for **flower buds and pollinator activity**, especially bees.
- Monitor **clusters along upper branches**, especially after extended rains.

4. Fruiting
The tree produces **woody capsule fruits**, each containing numerous **tiny seeds**.

- Capsules **mature several months after flowering**, turning from green to brown.
- Seeds are **wind-dispersed**, and fruiting can overlap with new flower cycles.

Observation Tips:

- Record **formation and drying** of seed capsules.
- Note **seed fall timing** and appearance of **capsule remnants** under the tree.

5. Seasonal Pattern (St. Croix)

- **Year-round**: Bark shedding and leaf retention
- **May–Oct (wet season)**: Increased flowering, fruiting, and new growth
- **Dry season (Jan–Mar)**: Slower activity, possible peak in bark color contrast

Phenological Markers – Ylang Ylang Tree (*Cananga odorata*)

1. Flowering

Ylang Ylang is renowned for its **long, drooping, star-shaped flowers** with narrow petals that start out greenish and become **bright yellow** as they mature. The scent is strongest at night.

- In tropical climates like St. Croix, **flowering may occur year-round**, but often intensifies during or just after the **wet season** (**May–October**).
- Flowers are typically found on **young branches**, especially in the upper and mid canopy.
- Each flower matures over several days, changing in **color and fragrance intensity**.

Observation Tips:

- Track **bud formation, first opening, and color changes** over the course of each bloom.
- Note **time of day fragrance peaks**—usually **late evening to early morning**.
- Photograph the tree **from below** to capture flower silhouette and positioning.

2. Fruiting

Fruits develop as **clusters of green to black, oval drupes**, often with 6–12 per cluster.

- Fruiting follows flowering and may occur several weeks later.
- As fruits ripen, they **darken to black** and contain **several seeds** each.
- Fruits are attractive to birds, aiding seed dispersal.

Observation Tips:

- Observe **cluster development, color changes, and fruit drop**.
- Look for **fruit-feeding birds**, especially in the early morning.

3. Leaf Behavior

The tree is **evergreen**, with **long, glossy, pointed leaves** that remain year-round.

- New leaf flushes can occur **after flowering cycles** or in response to rainfall.
- Leaf drop is minimal but may increase during drought or stress.

Observation Tips:

- Document **young leaf emergence**, typically lighter green and tender.
- Occasional **leaf yellowing or tip browning** can signal nutrient or water stress.

4. Seasonal Pattern (St. Croix)

- **May–Oct**: Most active flowering and fruiting season
- **Nov–Apr**: Reduced but ongoing flowering possible
- **Year-round**: Fragrance, evergreen canopy, and occasional fruiting

Phenological Markers for Southern Live Oak (*Quercus virginiana*)

1. Leaf Drop and Flush

Despite being called “evergreen,” Southern Live Oaks **do shed their leaves**, just not all at once. In fact, they often replace old leaves with new ones just before spring.

- **Leaf drop** typically occurs in **late winter to early spring** (e.g., February to April).
- A **flush of new leaves** often follows shortly thereafter, usually timed with rising temperatures and longer days.

Observation tips:

- Document *first signs of yellowing* or leaf browning.
- Track the *peak of leaf fall* and the *timing of new leaf emergence*.
- Photograph *contrast between old and new foliage*—new leaves are often lighter and softer in texture.

2. Flowering (Catkins)

Southern Live Oaks are **monoecious**, producing male and female flowers on the same tree. Male flowers appear as **dangling catkins**, while female flowers are tiny and budlike, often harder to spot.

- **Catkin emergence** typically occurs **in early spring** (around March in most subtropical climates).
- These produce heavy amounts of **pollen**—a noticeable event in itself.

Observation tips:

- Photograph *first appearance of catkins* and note density.
- Look for *pollen release* and *duration of flowering period*.
- Try to capture *female flowers* if visible (small and located closer to branch tips).

3. Acorn Development and Drop

Fertilized female flowers produce **acorns**, which develop over the summer and generally **mature by fall**.

- Acorns typically ripen and fall in **late summer to early fall** (August–October, depending on location and conditions).
- Note: Some Southern Live Oaks may produce heavy crops biennially (every other year).

Observation tips:

- Track *acorn development stages* (immature green → mature brown).
- Record *timing and abundance of acorn drop*.
- Observe *wildlife interaction* (birds, squirrels, etc.), which may affect how long acorns remain visible.

4. Lichen, Moss, and Epiphytes

In a moist tropical environment like St. Croix, Southern Live Oaks often support **lichens, mosses, and even epiphytic plants** on their bark and branches. While not a phenophase in the tree itself, their appearance may **correlate with humidity or seasonal changes**.

Observation tips:

- Photograph *bark surface over time* to track moss/lichen growth.
- Record *seasonal changes in density or visibility*.

Additional Notes for Your Project

- Southern Live Oak's **phenology is subtle but cyclical**. Over time, your observations will reveal clear annual rhythms, even if they're not dramatic at a glance.
- Regular monthly check-ins can help capture transitions that may otherwise go unnoticed.
- For long-lived species like this, **multi-year tracking** is particularly valuable.

Phenological Markers – West Indian Mahogany (*Swietenia mahagoni*)

1. Leaf Behavior

This species is **deciduous**, shedding all or most of its leaves during the **dry season**, especially in **January through March** in St. Croix.

- Leaf drop often precedes or coincides with **flowering**.
- The tree quickly produces a **new flush of compound leaves**—pinnate with 4–8 pairs of leaflets—just before or during flowering.

Observation Tips:

- Record **canopy thinning and full leaf drop**, especially in January–February.
- Track **leaf bud swelling and emergence of fresh foliage**—usually a bright light green.

2. Flowering

Mahogany flowers are **small, greenish-yellow**, and **fragrant**, appearing in **panicles** at the ends of twigs.

- Flowering typically occurs from **March to May** following leaf drop.
- Trees may flower **before full canopy is restored**, making inflorescences more visible.
- Flowers are **insect-pollinated**, often attracting bees and small beetles.

Observation Tips:

- Look for **tight, upright clusters** of buds.
- Document **flower opening, insect activity, and flower duration** (short-lived).
- Peak bloom is often **brief but intense**.

3. Fruiting

Mahogany produces **woody, oval seed capsules**, about 2–4 inches long, that **mature over several months**.

- Capsules **split open into five parts**, releasing numerous **winged seeds** that are wind-dispersed.
- Fruiting typically peaks in **late summer to early fall** (**August–October**).
- Empty capsules may remain on the tree long after seed dispersal.

Observation Tips:

- Track **pod swelling, surface texture changes, and the moment of dehiscence (splitting)**.

- Collect or photograph **dispersed seeds and their distinctive wings**.
- Note **wind conditions** during dispersal—seeds may travel significant distances.

4. Seasonal Pattern (St. Croix)

- **Jan–Mar**: Leaf drop
- **Mar–May**: Flowering + early leaf flush
- **Jun–Aug**: Fruit development
- **Aug–Oct**: Seed dispersal
- **Nov–Dec**: Full canopy and seed capsules may persist

Phenological Markers – Black Olive Tree (*Bucida buceras*)

1. Leaf Behavior

Black Olive is typically **evergreen in moist or coastal areas**, but it may become **briefly deciduous** in **dry conditions or drought stress**, especially during **January to March** in St. Croix.

- Leaves are **small, leathery, and simple**, arranged in tight spirals around branchlets.
- **New leaf flushes** occur after rain or flowering, emerging **light green** before maturing to a **dark, glossy green**.

Observation Tips:

- Watch for **flushing at branch tips** following dry spells or early wet season rains.
- Note **canopy density**—this tree's compact form can make subtle changes easy to overlook.

2. Flowering

Flowers are **tiny, yellow-green, and inconspicuous**, borne in **slender, hanging spikes**.

- Flowering usually begins in **late dry to early wet season** (**March–June**), but may occur more than once a year.
- Though not showy, the **mass flowering** of small blooms may produce a **light scent** and attract pollinators like bees and ants.

Observation Tips:

- Look for **threadlike flower spikes** at the ends of branches.
- Record **first flowering and duration**, and observe **insect visitation**.

3. Fruiting

Fruits are **small, oval, dark brown to black drupes**, giving the tree its common name.

- Fruiting typically follows flowering by several months, peaking between **June and September**.
- Fruits may **persist on the tree** and **fall gradually**, often accumulating under the canopy.

Observation Tips:

- Track **fruit development, color change, and drop**.
- Note any **wildlife feeding activity**, as birds may eat the small fruits.

4. Bark and Twigs
Not a phenological marker per se, but worth noting:

- Twigs have a **distinctive zig-zag pattern**, and the bark is smooth and gray on younger trees, becoming **rougher with age**.

5. Seasonal Pattern (St. Croix)

- **Jan–Mar**: Occasional leaf thinning or drop
- **Mar–Jun**: Flowering peak + new leaf flush
- **Jun–Sep**: Fruiting and seed drop
- **Oct–Dec**: Dense evergreen canopy, occasional sporadic flowering

Phenological Markers – Genip Tree (*Melicoccus bijugatus*)

1. Leaf Behavior
Genip is typically **semi-deciduous**, often shedding part or most of its foliage during the **late dry season** (**January to March**) in St. Croix.

- Leaves are **pinnately compound**, with 2–4 pairs of leaflets that are **dark green and leathery**.
- **New leaf flush** usually follows rains or coincides with the onset of flowering.

Observation Tips:

- Monitor for **leaf yellowing and canopy thinning** in late dry season.
- New flushes emerge **light green and soft**, rapidly darkening.

2. Flowering
Flowers are **small, creamy-white to greenish**, and produced in large numbers on **branched panicles**.

- Trees are **dioecious** (male and female flowers occur on separate trees), although some hermaphroditic forms exist.
- Flowering typically begins in **late dry season**, **March to May**, depending on rainfall.
- Flowering can be profuse and is key for fruit production in female trees.

Observation Tips:

- Track **timing and duration** of flowering for both male and female trees.
- Note **pollinator activity**, especially bees and ants.
- Flowering may occur before full leaf flush, so look for **bare or sparsely-leaved bloom phases**.

3. Fruiting
The fruit is a small, **green drupe**, about the size of a large marble, with a **thin rind and juicy orange pulp** surrounding a large seed.

- Fruits ripen over **2–4 months**, typically available from **July through September** in St. Croix.
- Ripe fruits may **drop naturally** or be collected from the tree.

Observation Tips:

- Track **fruit set rate**, color development, and maturity.
- Observe **fruit drop**, especially after storms or strong winds.

- Note any **animal interaction**, as birds and humans alike love the fruit.

4. Seasonal Pattern (St. Croix)

- **Jan–Mar**: Partial leaf drop
- **Mar–May**: Flowering and new leaf flush
- **May–Jun**: Early fruit development
- **Jul–Sep**: Fruit maturation and peak harvest
- **Oct–Dec**: Dense green canopy

Phenological Markers – Autograph Tree (*Clusia rosea*)

1. Leaf Behavior

This tree is **evergreen**, with **broad, leathery, dark green leaves** that are **opposite and obovate** (wider at the tip).

- Leaf drop is **minimal and unsynchronized**, often replaced quickly by new growth.
- Leaves are long-lived and may **accumulate inscriptions** (e.g., initials carved by visitors), which persist for years.

Observation Tips:

- Watch for **new leaf emergence**—young leaves are **pale green and tender**, often clustered near branch tips.
- Minimal seasonal variation, but **leaf flushes** may follow rainfall or pruning.

2. Flowering

Flowers are large (3–4 inches across), **wax-like**, and **pale pink to white**, with a bright yellow center.

- Flowers are **bisexual and fragrant**, usually opening in the **morning and closing by afternoon**.
- In St. Croix, flowering may occur **sporadically year-round**, but is more likely in the **wet season** (**May–October**).
- Flowers are **pollinated by bees**, though they produce little nectar.

Observation Tips:

- Track **bud formation, flower opening, and closure**.
- Note **pollinator activity**, especially during mid-morning.

3. Fruiting

Fruits are **round, green capsules** that split open like a star when mature, revealing **bright red pulp and shiny black seeds**.

- Fruit ripening and seed dispersal occur **several months after flowering**, often in **late wet to early dry season**.
- The colorful seeds are dispersed by **birds and gravity**.

Observation Tips:

- Observe **capsule development and splitting**—the dehisced fruit is visually striking.

- Note **seed drop and removal by birds** or other wildlife.

4. Growth Habit
The Autograph Tree often begins life as an **epiphyte**, establishing in the crooks of other trees before sending down roots.

- As it matures, it becomes a **free-standing tree** with a wide, spreading canopy and thick, twisting branches.
- This trait makes older individuals especially photogenic and useful for educational phenology material.

5. Seasonal Pattern (St. Croix)

- **Jan–Apr**: Occasional flowering and new leaf flush
- **May–Oct**: Peak flowering and fruit development
- **Nov–Dec**: Fruiting, seed dispersal, continued leaf growth
- **Year-round**: Evergreen foliage and epiphytic behavior in seedlings

Phenological Markers – Eggers' Coral Tree (*Erythrina eggersii*)

1. Leaf Behavior

This species is **deciduous**, shedding its trifoliate leaves during the **dry season**, particularly from **January through March** in St. Croix.

- Leaves consist of **three broad leaflets**, often with a soft, velvety texture when young.
- A pronounced **leaf flush** occurs after the first rains or just prior to flowering.

Observation Tips:

- Track **complete canopy loss**, especially in peak dry season.
- Watch for **flushes of new, tender leaves**, typically beginning **March–April**.

2. Flowering

The tree produces brilliant **scarlet to coral-red flowers**, arranged in **dense terminal racemes** (elongated clusters at branch tips).

- Flowering is most prominent **just before or during early leaf flush**, often when branches are still bare.
- Blooming typically occurs from **March to May**.
- Flowers are **highly attractive to hummingbirds** and bees.

Observation Tips:

- Document **first bloom, peak bloom, and bloom fade**.
- Capture images of **bare-branch flowering**—a signature visual.
- Note **hummingbird activity** during morning hours.

3. Fruiting

Fruits are **elongated, cylindrical seed pods**, containing **dark seeds** separated by slight constrictions (giving a "beads-on-a-string" appearance).

- Pods mature in **late spring to summer** and may **persist on the tree** after drying.
- Seed pods **split open** to release seeds by **late summer**.

Observation Tips:

- Record **pod formation, drying, and dehiscence** (splitting).
- Note **seed fall zones** and potential germination sites.

4. Growth & Conservation Note

- *Erythrina eggersii* is **listed as endangered** due to habitat loss and limited distribution.
- It often grows in **coastal scrub, dry forests, or rocky outcrops**, requiring **good drainage and sunlight**.
- Monitoring phenology contributes directly to **conservation efforts and seed viability studies**.

5. Seasonal Pattern (St. Croix)

- **Jan–Mar**: Leaf drop
- **Mar–May**: Peak flowering and early leaf flush
- **May–Jul**: Fruiting
- **Jul–Oct**: Seed dispersal and full canopy
- **Nov–Dec**: Canopy maintenance or thinning depending on rainfall

Phenological Markers – Rain Tree (*Samanea saman*)

1. Leaf Behavior
Rain Tree is **semi-deciduous**, shedding part of its foliage during the **dry season** (**January to March**) or in response to prolonged drought.

- Leaves are **bipinnately compound**, with numerous small leaflets that are **sensitive to light and moisture**.
- Leaflets **fold at night or on overcast/rainy days**, giving rise to the name "Rain Tree."

Observation Tips:

- Track **canopy density** throughout dry season.
- Record **leaflet folding behavior** at different times of day or during weather changes.
- Note **timing of new leaf flush**—typically **March to May**.

2. Flowering
Flowers are **pale pink to rose-colored** with **numerous stamens**, forming **small powderpuff clusters** on short stalks.

- Flowering generally occurs from **March to June** in St. Croix, often shortly after or overlapping with new leaf growth.
- Flowers are **lightly fragrant** and attractive to **bees and butterflies**.

Observation Tips:

- Look for **clusters of small buds and powderpuff blooms** near branch tips.
- Document **bloom density, peak, and decline**.
- Record **pollinator visits**, especially in early morning and late afternoon.

3. Fruiting
Fruits are **long, dark brown, flattened pods**, often slightly curved and sticky inside.

- Pods form soon after flowering and **ripen over several months**, typically by **late summer (August–October)**.
- They contain **multiple small seeds embedded in a sweet, edible pulp** that attracts animals and livestock.

Observation Tips:

- Monitor **pod development**, color change, and **seed release**.

- Note **animal interaction**, such as **mangoes, goats, or bats feeding on fallen pods**.
- Fallen pods may accumulate heavily beneath the tree.

4. Seasonal Pattern (St. Croix)

- **Jan–Mar**: Leaf thinning or partial drop
- **Mar–Jun**: Flowering and new leaf flush
- **Jul–Oct**: Pod maturation and seed dispersal
- **Nov–Dec**: Dense canopy, occasional leaf turnover

Phenological Markers – Marron Bacora (*Solanum conocarpum*)

1. Leaf Behavior

Marron Bacora is a **semi-deciduous shrub or small tree**, depending on environmental conditions.

- It tends to shed some or most of its **oval, soft-textured leaves** during the **dry season**, typically **January to March**.
- **New leaf growth** often appears with the arrival of **early rains or humid conditions**, especially from **April onward**.
- Leaves are **slightly hairy**, giving them a gray-green appearance.

Observation Tips:

- Track **leaf loss and regrowth timing**, especially in response to rainfall.
- Observe **young leaf emergence**, often a paler green and less hairy at first.

2. Flowering

Flowers are **violet to purple**, star-shaped with prominent yellow stamens, typical of the nightshade family.

- Flowering may occur **year-round** in moist conditions but often shows a **peak between April and July** in St. Croix.
- Flowers emerge **solitarily or in small clusters** from branch axils.

Observation Tips:

- Record **first bloom, peak flowering, and any repeat cycles**.
- Note **pollinator activity**, particularly small native bees or butterflies.
- Flowers may be short-lived but are frequently replaced when conditions are favorable.

3. Fruiting

Fruits are **oval to egg-shaped berries**, starting green and ripening to **yellow or orange**.

- Fruiting follows successful flowering and typically peaks from **late summer to early winter** (**August to November**).
- Fruits are **edible to birds and reptiles**, aiding seed dispersal.

Observation Tips:

- Monitor **fruit set**, color change, and any wildlife interaction.
- Document **timing of fruit ripening and drop**.

- Note whether **flowering and fruiting overlap**, which may occur in healthy individuals.

4. Conservation Note
This species is **federally listed as endangered** in the U.S. and faces threats from **habitat loss, invasive species, and drought stress**.

- Monitoring **phenological behavior** (flowering, fruiting, and leaf flush) can help inform **recovery and restoration strategies**.
- Every observation of a healthy specimen contributes to a better **ecological understanding and conservation record**.

5. Seasonal Pattern (St. Croix)

- **Jan–Mar**: Partial to full leaf drop
- **Apr–Jul**: Flowering and new leaf flush
- **Aug–Nov**: Fruiting and seed dispersal
- **Dec–Jan**: Possible flowering pause, leaf turnover

Phenological Markers – West Indian Satinwood (*Zanthoxylum flavum*)

1. Leaf Behavior

This species is **deciduous to semi-deciduous**, often shedding leaves during the **late dry season**, typically **January through March** in St. Croix.

- Leaves are **pinnately compound**, with several **oval leaflets**, sometimes edged with tiny teeth.
- The foliage is **lightly aromatic** when crushed and often emerges **soon after the dry season ends**.

Observation Tips:

- Track **degree of leaf drop**, which may vary by microclimate.
- New leaf flushes emerge **bright green and delicate**, often in tandem with flowering.

2. Flowering

Flowers are **small, pale yellow to greenish**, and produced in **loose terminal panicles**.

- Flowering usually occurs in **late dry to early wet season** (**March–May**).
- As a **dioecious** species, individual trees produce either male or female flowers.
- Flowers are **insect-pollinated**, especially by small native bees and flies.

Observation Tips:

- Watch for **bud development and flower clusters** forming at branch tips.
- Document **pollinator activity** and compare bloom duration across individual trees.

3. Fruiting

Fruits are small, **woody capsules** that turn from green to **dark brown or black** when ripe.

- The capsules split open to reveal **1–2 shiny black seeds**.
- Fruiting generally occurs **June through August**, with seeds dispersed by gravity or possibly birds.

Observation Tips:

- Monitor for **capsule development, dehiscence, and seed drop**.
- Fallen seeds may remain viable under the canopy or be collected for conservation.

4. Growth & Conservation Note

- *Z. flavum* is considered **threatened** due to illegal logging and habitat pressure.
- It grows **very slowly** and thrives in **dry, rocky or coastal scrub habitats**.
- Phenological data supports **seed banking, nursery propagation, and restoration efforts**.

5. Seasonal Pattern (St. Croix)

- **Jan–Mar**: Leaf drop
- **Mar–May**: Flowering + new leaf flush
- **Jun–Aug**: Fruiting and seed dispersal
- **Sep–Dec**: Leaf and branch development; occasional resting phase

Phenological Markers – Cigar Box Cedar (*Cedrela odorata*)

1. Leaf Behavior

C. odorata is **deciduous**, with a **clear period of leaflessness** during the **dry season**, typically from **January to March** in St. Croix.

- Leaves are **pinnately compound**, often **20–30 inches long**, with numerous **lance-shaped leaflets**.
- New leaf flush typically occurs **just after flowering**, usually by **April or May**.

Observation Tips:

- Track **timing and completeness of leaf drop**—mature trees may lose leaves almost entirely.
- New leaf growth is **soft, pale green**, and emerges rapidly once rains begin.

2. Flowering

Produces **panicles of small, white to pale greenish flowers**, which are **fragrant** and **rich in nectar**.

- Flowering begins in **late dry season** (**March–April**) after or during leaf drop.
- The tree is **monoecious**, bearing male and female flowers on the same tree.
- Pollinated primarily by **insects**, especially bees.

Observation Tips:

- Look for **clusters of tiny blooms** along terminal branches.
- Note **pollinator visits**, especially on sunny mornings.
- Flowering often coincides with **a largely bare canopy**, improving visibility.

3. Fruiting

Fruits are **woody capsules**, about 1–2 inches long, that **split into five parts**, releasing **winged seeds**.

- Fruit development occurs over **several months**, with seed dispersal usually in **late summer to early fall** (**August–October**).
- Seeds are **wind-dispersed** and lightweight.

Observation Tips:

- Track **fruit set**, color change, and **capsule dehiscence (splitting)**.
- Look for **seed release during breezy conditions**, often seen fluttering to the ground.

4. Seasonal Pattern (St. Croix)

- **Jan–Mar**: Full or near-full leaf drop
- **Mar–Apr**: Flowering
- **Apr–May**: New leaf flush
- **Jun–Oct**: Fruiting and seed dispersal
- **Nov–Dec**: Full canopy, slower activity

Phenological Markers – Sea Grape Tree (*Coccoloba uvifera*)

1. Leaf Behavior

Sea Grape is **evergreen**, but **leaf turnover is frequent**, especially during **dry spells or wind exposure**.

- Leaves are **large, leathery, and nearly circular**, often with prominent red veins.
- New leaves emerge **reddish-bronze**, maturing to **glossy green**.
- In coastal areas, **salt spray and wind** may cause seasonal leaf tip browning or edge burn.

Observation Tips:

- Record **leaf color transitions** and note timing of **young leaf flushes**.
- Watch for **leaf fall under high wind or drought stress**, typically **January–March**.

2. Flowering

Flowers are **small, white to greenish**, and produced in **long, slender, upright spikes**.

- Flowering typically begins in **late dry season**, often **March–May**, though may occur year-round in favorable conditions.
- Trees are **dioecious**, with male and female flowers on separate trees.
- Flowers are lightly fragrant and **attract bees, flies, and beetles**.

Observation Tips:

- Document **first appearance of flower spikes**, especially after dry spells.
- Observe **insect activity**, particularly during early morning.

3. Fruiting

Fruit develops in **long clusters**, resembling bunches of grapes. Each “grape” is a **round drupe** that starts **green**, ripens to **purple**, and contains a large seed.

- Fruiting follows flowering and usually peaks from **July to September**.
- Ripe fruits are edible and attract **birds, iguanas, and humans alike**.

Observation Tips:

- Track **fruit set, color change, and drop**.
- Monitor **fruit scavenging by animals** or fruit drop after rain.
- Note **fruit abundance**, which varies by year and tree.

4. Seasonal Pattern (St. Croix)

- **Jan–Mar**: Leaf turnover or stress shedding
- **Mar–May**: Flowering
- **May–Jun**: Early fruit development
- **Jul–Sep**: Fruit ripening and dispersal
- **Oct–Dec**: Canopy growth, possible secondary flowering

Phenological Markers – Florida Strangler Fig (*Ficus aurea*)

1. Leaf Behavior

Ficus aurea is typically **evergreen** in tropical climates like St. Croix, but may be **briefly semi-deciduous** in drought or stress conditions.

- Leaves are **simple, alternate, and elliptical**, with a **shiny, dark green upper surface** and lighter underside.
- New leaves emerge in a **flush of light green or reddish-bronze**, often in response to rainfall.

Observation Tips:

- Watch for **young leaf flushes**, especially in **March–May** and after heavy rains.
- Note any **temporary leaf thinning** during very dry months (e.g., February).

2. Flowering (Syconia Development)

As with all figs, the flowers are **hidden inside the fig fruit** (called a *syconium*), which acts as both flower and fruit.

- Fig development may occur **multiple times per year**, without a strict season, depending on **rainfall and tree maturity**.
- The tree has a **mutualistic relationship with its specific fig wasp pollinator**, which enters the syconium to pollinate internal flowers.

Observation Tips:

- Observe the **appearance of small green figs** directly on twigs or leaf axils.
- Mature figs turn **yellow or reddish**, often attracting birds and bats.
- Flowering and fruiting cycles can **overlap** and occur **multiple times per year**.

3. Fruiting

Figs are **small (1–2 cm), round to pear-shaped**, turning from **green to yellow or red** when ripe.

- Fruit production is **abundant and staggered**, often seen **year-round**, with **peaks following rainy periods**.
- Ripe figs are a major food source for **birds, bats, and insects**, making the tree a **keystone species**.

Observation Tips:

- Track **fruit abundance, ripening, and drop** throughout the year.
- Record **wildlife visitation**, especially during heavy fruiting periods.

4. Growth Habit
Starts life as an **epiphyte** on a host tree or structure. Over time, it sends down **aerial roots** that reach the ground, thicken, and eventually **strangle and replace the host**.

- Mature trees can reach **50–60 feet tall**, with a wide, dense canopy and **massive trunk formed by coalescing roots**.
- Strongly associated with **moist habitats, ruins, or older trees**, but can grow in a variety of locations.

5. Seasonal Pattern (St. Croix)

- **Jan–Mar**: Occasional leaf thinning; sporadic fig formation
- **Apr–Aug**: New leaf flushes, fig development and ripening
- **Sep–Dec**: Steady foliage; occasional fig crops depending on rainfall

Phenological Markers – Golden Apple (*Spondias dulcis*)

1. Leaf Behavior

Golden Apple is **deciduous**, shedding its leaves during the **dry season**, especially from **January to March** in St. Croix.

- Leaves are **pinnately compound**, with 9–25 leaflets per leaf.
- Leaf drop may be **partial or complete**, often followed by **rapid new growth** in spring.

Observation Tips:

- Track **canopy thinning and full leaf drop** in early dry season.
- Watch for **new flushes of soft green leaves** by **March–April**, sometimes coinciding with flowering.

2. Flowering

The tree produces **small, white to yellowish flowers** in long, slender, hanging **panicles**.

- Flowering typically occurs **just after or during leaf flush**, usually **March to May**.
- Flowers are **fragrant and abundant**, and pollinated by **bees and other small insects**.

Observation Tips:

- Monitor for **emergence of flower panicles** near branch tips.
- Record **flower density, peak bloom, and insect activity**.

3. Fruiting

The fruit is an **oval, green drupe** that ripens to **golden-yellow**. It has a **fibrous interior and central stone**.

- Fruiting follows flowering and typically peaks from **June to September**.
- Fruits are edible when **green (tart)** or **ripe (sweet and soft)**.

Observation Tips:

- Track **fruit development and ripening**, especially color changes.
- Note **fruit drop**, which may increase after rains or winds.
- Observe **animal activity**, such as birds or humans harvesting fruit.

4. Growth Habit

Golden Apple grows quickly, forming a **broad, rounded canopy**.

- Branches are often **upright and spreading**, and **lower limbs may bear fruit**, making it ideal for community harvest.

5. Seasonal Pattern (St. Croix)

- **Jan–Mar**: Leaf drop
- **Mar–May**: Leaf flush and flowering
- **Jun–Sep**: Fruit development and ripening
- **Oct–Dec**: Canopy regrowth and occasional flowering

Phenological Markers – Java Plum (*Syzygium cumini*)

1. Leaf Behavior

Java Plum is typically **evergreen** in tropical climates like St. Croix.

- Leaves are **opposite, leathery, and oblong**, with a **strong spicy scent** when crushed.
- Occasional **leaf drop may occur during the dry season** (**January–March**), especially in older trees, but the canopy is quickly replenished.

Observation Tips:

- Track **young leaf flushes**, which emerge **pinkish to light green** and darken with age.
- Note any **seasonal canopy thinning** in response to drought or pruning.

2. Flowering

Produces **clusters of small, creamy-white flowers** on **older branches**, not just at the tips.

- Flowering typically occurs **late dry to early wet season**—around **March to May**.
- Flowers are **fragrant**, rich in nectar, and attract **bees and other pollinators**.

Observation Tips:

- Look for **clusters of short flower spikes (panicles)** along woody limbs.
- Document **bloom density, pollinator activity, and duration of flowering**.

3. Fruiting

Fruits are **oval berries**, starting green, turning **pink, then deep purple-black** when ripe.

- Fruiting usually follows flowering by a few months, peaking from **June to August**.
- The fruit is juicy, **astringent when unripe**, and **sweet-tart when fully ripe**.
- Seeds are dispersed by **birds, bats, and humans**.

Observation Tips:

- Monitor **fruit color transitions**, from green → red → purple-black.
- Track **fruit drop and foraging activity** by wildlife.
- Note **fermentation odor** under mature trees with heavy fruit fall.

4. Growth Habit
Java Plum can grow into a **large, dense-canopied tree** with a **twisted trunk** and smooth gray bark that flakes with age.

- Ideal for shade, but can become invasive if not managed—**monitor for suckering** or seedling spread nearby.

5. Seasonal Pattern (St. Croix)

- **Jan–Mar**: Occasional leaf turnover
- **Mar–May**: Flowering
- **Jun–Aug**: Fruiting
- **Sep–Dec**: Canopy maintenance; occasional leaf flush or stress response

Phenological Markers – Mesple (*Manilkara zapota*)

1. Leaf Behavior

Manilkara zapota is **evergreen**, with **simple, glossy, dark green leaves** that are **elliptical to oblong** in shape.

- Leaf drop is **minimal and gradual**, occurring **individually** throughout the year.
- New leaf flushes are subtle, usually appearing in **light green clusters** at branch tips.

Observation Tips:

- Watch for **young leaf emergence**, often tied loosely to **moisture availability**.
- Leaves are **tough and leathery**, remaining on the tree for extended periods.

2. Flowering

Flowers are **small, white to pale cream**, and **bell-shaped**, with a light **sweet fragrance**.

- They emerge **individually or in small clusters** in leaf axils.
- Flowering can occur **sporadically throughout the year**, though **spring and early summer (March–June)** tend to show more activity.

Observation Tips:

- Monitor **leaf axils for buds**—flowers are small and easily missed.
- Track **bloom frequency** and link it with fruiting success.

3. Fruiting

The fruit is **round to oval**, with a **rough brown skin** and **sweet, grainy brown pulp** containing **black, glossy seeds**.

- Fruits take **4–8 months to mature** after pollination.
- Fruiting is often **staggered** and **non-seasonal**, though **March–August** may see heavier loads, especially following rainfall.

Observation Tips:

- Track **fruit size and color change**—ripe fruits yield slightly to pressure.
- Record **natural fruit drop** and **wildlife interaction**, especially birds, bats, or rodents.
- Note that **immature fruit contains latex** and should not be consumed.

4. Growth Habit
A **medium to large evergreen tree**, reaching **30–60 feet** in height.

- Bark is **gray and furrowed**, exuding **milky latex (chicle)** when cut.
- Tree prefers **well-drained soils** and **full to partial sun**, with **slow to moderate growth**.

5. Seasonal Pattern (St. Croix)

- **Jan–Mar**: Steady canopy, occasional flowering
- **Mar–Jun**: Flowering and early fruit set
- **Jul–Sep**: Fruit development
- **Oct–Dec**: Ripening and harvest
- **Year-round**: Some flowering and fruiting may occur depending on moisture and maturity

Phenological Markers – Divi Divi (*Libidibia coriaria*)

1. Leaf Behavior
Divi Divi is **deciduous**, often shedding most or all of its leaves during the **dry season**.

- Leaves are **bipinnately compound**, with **many small, feathery leaflets**.
- **Leaf drop** typically occurs **January–March**, but may vary with drought intensity.
- New leaf flushes emerge **with the first rains** or after flowering, usually in **March–April**.

Observation Tips:

- Track **timing and extent of defoliation** during the dry season.
- Watch for **new, soft green leaves** re-emerging at branch tips after rainfall.

2. Flowering
Flowers are **small, yellowish-white**, and **fragrant**, occurring in **loose, upright clusters (racemes)**.

- Flowering generally begins **just after the dry season**, typically **March–May**.
- Flowers are **insect-pollinated** and may be subtle unless observed up close.

Observation Tips:

- Look for **upright flower spikes** forming soon after new leaf growth.
- Monitor **pollinator visits**, particularly bees and small wasps.

3. Fruiting
Fruits are **distinctive, twisted, dark brown pods**, often curled into a “C” or double spiral.

- Pods ripen **June–August** and are **high in tannins**, traditionally used for leather tanning and dye.
- Fruit often remains on the tree even after drying.

Observation Tips:

- Track **fruit development**, especially the **change from green to leathery brown**.
- Record **pod retention**, drop, and collection by wildlife or people.

4. Growth Habit
Divi Divi typically grows to **20–40 feet**, though often much shorter due to **constant wind pruning**.

- It has a **low, spreading canopy** and trunks that may lean or curve in the direction of prevailing winds.
- Exceptionally **drought-tolerant**, it is found in **coastal and arid regions** and is a strong **pioneer species**.

5. Seasonal Pattern (St. Croix)

- **Jan–Mar**: Leaf drop
- **Mar–May**: New leaves and flowering
- **Jun–Aug**: Pod development and ripening
- **Sep–Dec**: Dry pods may persist; foliage stable or partially thinned depending on conditions

Phenological Markers – Shower of Gold Tree (*Cassia fistula*)

1. Leaf Behavior
This tree is **deciduous**, typically shedding most or all of its leaves **just before flowering**, often resulting in a visually dramatic, flower-covered tree with **bare branches**.

- Leaves are **compound**, with **3–8 pairs of smooth-edged, oval leaflets**.
- Leaf drop occurs primarily in the **late dry season** (**February–April**), shortly before the onset of rains.

Observation Tips:

- Watch for **complete or near-complete leaf drop** in early spring.
- Record **timing of new leaf flush**, which usually follows flowering.

2. Flowering
Produces large, **pendulous clusters of bright yellow flowers**, each with five petals and prominent stamens.

- Flowering usually begins in **late dry to early wet season**, typically **April–June** in St. Croix.
- The display is often **spectacular and nearly leafless**, enhancing visibility.
- Flowers are **lightly fragrant** and **attract bees and butterflies**.

Observation Tips:

- Document **first bloom, peak flowering, and decline**.
- Capture the **"golden shower" effect** during full bloom.
- Note **pollinator activity**, especially during warm, sunny days.

3. Fruiting
Fruits are **long, cylindrical pods** (up to 2 feet), **dark brown to black** when mature, and filled with **flattened seeds in sticky pulp compartments**.

- Pods **develop after flowering** and **hang conspicuously** from branches.
- Fruiting season usually spans **June–September**, with pods persisting into fall.

Observation Tips:

- Track **pod formation, color change, and persistence**.
- Note **seed drop** and **wildlife interaction**, particularly birds or monkeys in other tropical regions (less likely in St. Croix).

4. Growth Habit
Cassia fistula forms a **medium-sized tree** with an **open, spreading crown**.

- It is often used in ornamental settings for its **showy seasonal flowers** and **fast growth**.

5. Seasonal Pattern (St. Croix)

- **Jan–Mar**: Leaf drop
- **Apr–Jun**: Spectacular flowering, often with bare branches
- **Jun–Sep**: Pod development and seed formation
- **Oct–Dec**: New leaf flush and canopy regrowth

Phenological Markers – Schwartz's Pigeonplum (*Coccoloba swartzii*)

1. Leaf Behavior

Coccoloba swartzii is a **semi-evergreen to evergreen** tree, with **broad, leathery leaves** that may vary slightly in shape but are typically **oval to round**, with a **smooth edge** and **prominent veins**.

- It retains most of its foliage year-round in moist conditions, but may **shed some leaves during dry months**.
- New leaves emerge in **flushes**, often **reddish to bronze** before maturing to green.

Observation Tips:

- Watch for **subtle leaf flushing**, especially **March–May** or after rainfall.
- Note any **seasonal thinning** during extended dry periods (e.g., **February–April**).

2. Flowering

Flowers are **tiny, white-green**, and borne in **elongated spikes** (up to 4 inches long) that emerge at the tips of branches or in leaf axils.

- Blooming typically occurs in **spring to early summer**, especially **April–June**.
- The flowers are **fragrant** and attract **bees and other small insects**.

Observation Tips:

- Monitor **branch tips and leaf axils** for developing flower spikes.
- Document **pollinator activity**, especially on warm mornings.

3. Fruiting

The fruit is a **small, round drupe**, initially green, turning **red to dark purple when ripe**.

- Fruits are **edible** and mildly sweet, though not widely cultivated.
- Fruiting follows flowering, with mature fruit typically present **July–September**.
- The fruit is important to **birds and small mammals** for foraging.

Observation Tips:

- Track **color progression** of fruit clusters.
- Record **fruit drop**, **wildlife feeding**, and natural seed dispersal patterns.

4. Growth Habit

A **small to medium-sized tree**, usually **20–35 feet tall**, with a **rounded crown** and **light gray bark**.

- Found in **dry forests, coastal thickets, and limestone soils**.
- Highly tolerant of **salt, wind, and poor soil**, making it a **valuable coastal stabilizer** and native landscaping choice.

5. Seasonal Pattern (St. Croix)

- **Feb–Apr**: Light leaf thinning; early flower spikes may form
- **Apr–Jun**: Peak flowering and new leaf flush
- **Jul–Sep**: Fruiting; canopy stability
- **Oct–Jan**: Gradual return to full leaf cover if previously thinned

Phenological Markers – Cashew Tree (*Anacardium occidentale*)

1. Leaf Behavior

The Cashew is **semi-deciduous**, with **broad, leathery, obovate leaves** that may shed seasonally depending on local moisture conditions.

- Leaf fall occurs mainly during the **dry season (January–March)**.
- **New leaves emerge** in a flush, **reddish-pink to coppery**, maturing to **dark green**.

Observation Tips:

- Track **canopy thinning during dry months** and **timing of fresh leaf emergence**.
- Observe **color progression** in new foliage during flushes.

2. Flowering

Produces **small, pale green to pinkish flowers** in **loose terminal panicles**, with both **male and bisexual flowers** present on the same tree.

- Flowering begins near the **end of the dry season**, typically **February to April** in St. Croix.
- Flowers are **fragrant** and attract **bees, wasps, and flies**.

Observation Tips:

- Look for **panicle emergence**, flower density, and **flower type ratios** (male vs bisexual).
- Note **pollinator visitation** during warm, dry days.

3. Fruiting

This species has a unique fruit structure:

- The **true fruit** is the **kidney-shaped cashew nut**, which develops at the end of the **cashew apple**, a fleshy, swollen **receptacle** that is **red or yellow**.
- Fruiting follows flowering, with fruits typically maturing **April through June**.
- The **cashew apple** is juicy and edible but **highly perishable**; the **nut is encased in a toxic shell** and requires processing before consumption.

Observation Tips:

- Track **fruit development**, from flowering panicles to **mature apple and nut formation**.
- Record **ripening stages** and **color change** in the cashew apple.

- Note **fruit drop and animal interactions**, especially birds and fruit bats.

4. Growth Habit
Cashew trees are **low-branching and spreading**, with a broad crown.

- Tolerant of **dry, sandy, or rocky soils**, they are well suited to coastal environments but can be damaged by strong winds.

5. Seasonal Pattern (St. Croix)

- **Jan–Mar**: Partial leaf drop
- **Feb–Apr**: Flowering and new leaf flush
- **Apr–Jun**: Fruit development and harvest period
- **Jul–Dec**: Canopy maintenance and rest phase

Phenological Markers – Physic Nut (*Jatropha curcas*)

1. Leaf Behavior

Physic Nut is **deciduous**, especially in dry or drought-prone conditions.

- Leaves are **broad, deeply veined**, and typically **3–5 lobed**.
- Leaf drop is common in the **dry season (January–March)** or during extended droughts.
- **New leaf flushes** emerge rapidly with rainfall or irrigation.

Observation Tips:

- Monitor **timing and extent of leaf loss**, particularly in dry months.
- Record **leaf regeneration**, noting color and rate of canopy recovery after rains.

2. Flowering

Flowers are **small, yellowish-green**, and produced in **clusters (cymes)** at the branch tips.

- *J. curcas* is **monoecious**, bearing both **male and female flowers** on the same plant.
- Flowering can occur **several times a year**, often peaking in the **early wet season (April–June)**.

Observation Tips:

- Look for **small inflorescences** at new growth points.
- Track **flowering frequency**, and monitor for **pollinator visits** (mostly small bees and flies).
- Note **flower ratios** (male vs female) as they vary by environmental conditions.

3. Fruiting

Fruits are **green, oval capsules** that turn **yellowish or brown** as they mature.

- Each capsule contains **three black seeds**, which are **toxic if ingested** but rich in oil.
- Fruiting typically follows flowering by several weeks and can occur **two or more times per year**, depending on rainfall.

Observation Tips:

- Document **fruit set, ripening, and seed release**.
- Watch for **capsule drying and natural splitting (dehiscence)**.
- Handle with care—**seeds are poisonous**.

4. Growth Habit
Grows as a **woody shrub or small tree**, usually **6–15 feet tall**.

- Very drought-tolerant, making it suitable for **xeric landscapes**, but it can spread aggressively in some areas.
- Frequently used in **hedges or erosion control plantings**, but all parts are **toxic** if consumed.

5. Seasonal Pattern (St. Croix)

- **Jan–Mar**: Leaf drop
- **Apr–Jun**: Leaf flush and flowering
- **Jun–Sep**: Fruit development and seed dispersal
- **Oct–Dec**: Possible secondary flowering/fruiting

Phenological Markers – Achiote Tree (*Bixa orellana*)

1. Leaf Behavior

Achiote is **evergreen to semi-deciduous**, depending on rainfall and site conditions.

- Leaves are **heart-shaped with a pointed tip**, soft-textured, and **light green to bronze** when young.
- Leaf drop is usually **minimal**, but slight thinning may occur during the **dry season (Jan–Mar)** or under stress.

Observation Tips:

- Watch for **new leaf flushes** after early rains, typically in **March–May**.
- Note **leaf color and shape consistency** as identifiers.

2. Flowering

Produces **clusters of pink to pale purple, hibiscus-like flowers**, each lasting only a day.

- Flowering is **highly ornamental** and typically peaks **just before or during the wet season** (**April–June**).
- Flowers are **5-petaled** and appear in **terminal clusters**, often blooming in waves.

Observation Tips:

- Document **first bud appearance, peak bloom, and flower longevity**.
- Track **insect activity**, particularly **bees and butterflies**.

3. Fruiting

Fruits are **bristly, reddish capsules** that **split open when ripe**, revealing **dozens of small red seeds** coated in **annatto dye** (bixin).

- Fruiting begins **shortly after flowering**, typically **May–August**, with capsules maturing and drying over several weeks.
- Seeds are collected for use in **culinary coloring, body paint, and natural cosmetics**.

Observation Tips:

- Monitor **capsule development and ripening color changes**.
- Record **pod dehiscence and seed exposure**, which occurs naturally as pods dry and split.
- Seeds may be harvested or **scattered by birds**.

4. Growth Habit
Achiote grows as a **dense, upright shrub or small tree**, usually **6–15 feet tall**.

- It thrives in **well-drained soils** and **full sun**, making it well suited for tropical gardens and ethnobotanical displays.

5. Seasonal Pattern (St. Croix)

- **Jan–Mar**: Light leaf thinning
- **Apr–Jun**: Flowering and new growth
- **May–Aug**: Fruit development and seed dispersal
- **Sep–Dec**: Full canopy, possible secondary flowering

Phenological Markers – Inkberry (*Randia aculeata*)

1. Leaf Behavior

Randia aculeata is **evergreen**, with **small, opposite leaves** that are **oval to oblong**, smooth-edged, and often shiny on the upper surface.

- The plant maintains foliage **year-round**, though minor leaf drop may occur during **extended droughts**.
- Leaf color remains a **steady medium to dark green**, with subtle new leaf flushes after rainfall.

Observation Tips:

- Look for **small flushes of lighter green new growth** at branch tips.
- Document any **drought-related yellowing or leaf loss** (usually brief and limited).

2. Flowering

Flowers are **white, tubular, and fragrant**, opening primarily in the **evening or early morning**, and are **pollinated by moths and bees**.

- Flowering typically occurs in **May–August**, but some blooming can happen **sporadically throughout the year** in response to moisture.
- Flowers are **borne singly or in pairs** at leaf axils and are usually **about 1 inch long**.

Observation Tips:

- Watch for **flower buds and bloom opening** around **sunset or early morning**.
- Track **pollinator activity**, especially **moths**.

3. Fruiting

The fruit is a **small, round, black berry** (about 1–1.5 cm in diameter) with **dark pulp** and **several seeds**.

- Berries **develop quickly** after flowering and are **used in traditional ink and dye** production (hence the name).
- Fruiting season generally follows flowering, **June–September**, with some variation.

Observation Tips:

- Monitor **fruit development**, color shift from green to **glossy black**, and eventual **fruit drop**.

- Note any **bird activity**, as the berries attract small frugivorous species.

4. Growth Habit
Typically grows as a **dense, multi-stemmed shrub** or small tree, usually **6–15 feet tall**.

- Older stems may have **short spines**, especially in dry or exposed conditions.
- Well adapted to **coastal scrub, limestone soils, and dry forest edges**.

5. Seasonal Pattern (St. Croix)

- **Mar–Apr**: Minor leaf turnover; buds may begin forming
- **May–Aug**: Peak flowering
- **Jun–Sep**: Fruiting and berry drop
- **Oct–Feb**: Stable canopy; occasional flowering if rains occur

Phenological Markers – Noni (*Morinda citrifolia*)

1. Leaf Behavior

Noni is **evergreen**, with **large, opposite, glossy leaves** that are **broad, ovate**, and sometimes wavy at the edges.

- Leaf drop is **infrequent**, though older leaves may yellow and fall throughout the year.
- New leaves are **lighter green** and emerge regularly with **no strong seasonal pattern**.

Observation Tips:

- Monitor for **young leaf emergence**, especially after rainfall.
- Watch for **leaf yellowing** near the base of branches—normal aging rather than stress.

2. Flowering

Flowers are **small, white, tubular**, and emerge from **conical green flower heads**.

- Noni flowers **continuously throughout the year**, often with **multiple stages (flowering, fruiting) present at once** on the same plant.
- Pollinated primarily by **small insects** and **self-compatible**.

Observation Tips:

- Track **emergence of new flower heads** and **flower density** per head.
- Observe **insect interactions**, particularly in early morning.

3. Fruiting

The fruit is an **irregular, bumpy compound structure**, starting green and ripening to **pale yellow-white**.

- Ripe fruit has a **strong, cheesy or fermented odor**.
- Fruits are **present nearly year-round**, with **peak production following rainfall**.
- Seeds are **dispersed by animals and water**.

Observation Tips:

- Record **fruit formation, ripening, and drop**.
- Note the **distinct smell** of ripe fruit and **animal interest** (rats, birds, even crabs).
- Monitor for **fermentation or mold** on fallen fruits.

4. Growth Habit
Noni grows as a **small tree or large shrub**, usually **10–20 feet tall**, and is **resilient in poor soils and saline conditions**.

- Commonly found in **disturbed areas, roadsides, and coastal edges**, making it ecologically flexible.

5. Seasonal Pattern (St. Croix)

- **Year-round**: Leaf production, flowering, and fruiting occur continuously
- **May–Nov**: Increased fruit set and ripening following rain
- **Dec–Apr**: Reduced fruit load but still active growth and flowering

Phenological Markers – Giant Sea Grape Tree (*Coccoloba uvifera*)

1. Leaf Behavior

Sea Grape is **evergreen**, with **large, leathery, round leaves**, often with **prominent red veins** and flushed edges in young growth.

- Leaf drop is **minimal and gradual**, often occurring **year-round** as older leaves are replaced.
- New leaves appear **reddish to bronze**, turning **deep green** with maturity.

Observation Tips:

- Watch for **new leaf flushes**, especially following **rainfall or pruning**.
- Track **color changes in young leaves** as a visual cue for recent growth.

2. Flowering

Flowers are **small, white to cream-colored**, borne on **long, hanging spikes (catkins)**.

- Flowering typically occurs **in the dry-to-wet season transition**, around **March to May**.
- Flowers are **fragrant** and **highly attractive to bees and flies**.

Observation Tips:

- Monitor for **flower spike emergence**, particularly at branch tips.
- Note **pollinator activity**, often abundant on warm, dry mornings.

3. Fruiting

Produces **clusters of round, green fruit** that resemble grapes, ripening to **purple or reddish-black**.

- Fruiting follows flowering by several weeks, with ripe fruit present **May to August**.
- Fruits are **edible** and may be used for **jelly, wine, or fresh eating**.
- Fruit drop and animal interaction (especially birds) are common during peak ripening.

Observation Tips:

- Track **fruit color change**, especially on lower branches.
- Note **wildlife presence**, such as birds or crabs feeding beneath fruiting trees.
- Monitor **fruit drop** and natural seedling germination nearby.

4. Growth Habit
Sea Grape can grow as a **large shrub or wide-canopied tree**, often **wind-sculpted in coastal exposure**.

- Mature trees have **smooth, peeling bark** in shades of red and gray.
- Strongly **salt-tolerant** and used in **dune restoration and erosion control**.

5. Seasonal Pattern (St. Croix)

- **Jan–Mar**: Leaf flushes, occasional old leaf drop
- **Mar–May**: Flowering
- **May–Aug**: Fruiting and ripening
- **Sep–Dec**: Seedling establishment and steady canopy growth

Phenological Markers – Baobab Tree (*Adansonia digitata*)

1. Leaf Behavior

Baobab is **deciduous**, shedding all its leaves during the **dry season**.

- Leaves are **palmately compound**, typically with **5–7 leaflets** resembling a hand.
- Full leaf drop generally occurs **December to March** in the Virgin Islands, leaving the tree **completely bare**.
- New leaf growth begins with the onset of rains, typically **April to May**.

Observation Tips:

- Note **timing of complete leaf loss**, which gives the tree its famous "upside-down" look.
- Record the **first flush of new leaves**, especially in April.

2. Flowering

Produces **large, white, waxy flowers** that are **bell-shaped**, **crinkled**, and **strongly scented (often musky or unpleasant)**.

- Flowers open **at dusk** and are **pollinated by bats**, lasting only a single night.
- Flowering typically occurs **shortly after leaf emergence**, around **May–July**.

Observation Tips:

- Look for **flower buds during the early wet season**.
- Observe **evening bloom events**—flowers often **open dramatically at twilight**.
- Note any **bat activity** or fallen flowers the next morning.

3. Fruiting

Fruits are **large, ovoid capsules** with a **woody shell** and **powdery, vitamin C-rich pulp** surrounding seeds.

- Fruit takes several months to develop, typically maturing **August to November**.
- Fruits hang from long stalks and may persist on the tree well into the dry season .

Observation Tips:

- Monitor for **young fruit set**, **maturity color change**, and **natural drop**.
- Record **wildlife interaction** or human collection—fruit is used for food, drink, and traditional medicine.

4. Growth Habit
Baobabs can grow for **centuries**, with some Caribbean specimens exceeding **30 feet in trunk diameter**.

- Trunks store water, allowing survival through **long droughts**.
- Growth is **slow**, but individuals are **exceptionally resilient** and culturally significant.

5. Seasonal Pattern (St. Croix)

- **Dec–Mar**: Leafless, dormant appearance
- **Apr–May**: Leaf flush and flower bud emergence
- **May–Jul**: Flowering
- **Aug–Nov**: Fruit development and ripening

Phenological Markers – Wild Cinnamon Tree (*Canella winterana*)

1. Leaf Behavior

Wild Cinnamon is **evergreen**, maintaining its **shiny, leathery, dark green leaves** throughout the year.

- Leaves are **simple, alternate, and oblong**, with a noticeable **pale midrib**.
- Leaf turnover is **gradual**, with **no strong seasonal leaf drop** observed.

Observation Tips:

- Track **new leaf emergence** at branch tips, often with a **bronze or reddish tinge**.
- Monitor for **leaf aging and shedding**, which occurs **individually and unobtrusively**.

2. Flowering

Flowers are **small, pink to purple**, star-shaped, and strongly **fragrant**, often growing in **tight axillary clusters**.

- Flowering typically occurs **in the spring to early summer** (**March–June**), though light flowering can occur at other times.
- The flowers are **attractive to bees** and give the tree a **soft ornamental quality**.

Observation Tips:

- Look for **dense flower clusters along branches**, especially on mature wood.
- Track **fragrance intensity**, which increases in warm morning hours.
- Record **pollinator visits**, especially small bees and hoverflies.

3. Fruiting

Fruits are **bright red berries**, about the size of a pea, that stand out against the green foliage.

- Fruiting follows flowering, typically **June–August**, but ripe berries may persist into fall.
- Fruits are **consumed by birds**, aiding in natural seed dispersal.

Observation Tips:

- Monitor **fruit development**, from green to red.
- Record **fruit drop and wildlife interaction**, especially with frugivorous birds.

4. Growth Habit
A **slow-growing, understory tree**, Wild Cinnamon usually reaches **15–25 feet** in height.

- Prefers **moist, well-drained soils**, often found in **semi-shaded forest habitats**.
- The bark is **pungently aromatic**, releasing a **cinnamon-clove scent** when scraped.

5. Seasonal Pattern (St. Croix)

- **Jan–Feb**: Steady canopy; minimal change
- **Mar–Jun**: Peak flowering
- **Jun–Sep**: Fruiting (bright red berries)
- **Oct–Dec**: Canopy maintenance and occasional flowering

Phenological Markers – Dog Almond (*Andira inermis*)

1. Leaf Behavior

- - Semi-evergreen to deciduous in dry conditions.
- - Pinnate leaves may be shed partially or fully depending on drought severity.

2. Flowering

- - Fragrant, purplish-pink flowers borne in dense terminal panicles.
- - Blooms typically appear before full leaf flush (late dry to early wet season).

3. Fruiting

- - Fruits are small, woody drupes that mature several months after flowering.
- - Often persist into the dry season before dropping.

4. Growth Habit

- - Tall tree with upright branching and dense foliage.
- - Common in urban plantings and roadsides; roots may fix nitrogen.

5. Observation Tips

- - Note any nitrogen-fixing nodules if root zone is visible or soil is disturbed.
- - Track leaf regrowth and new shoot formation after significant rain events.
- - Watch for fruit persistence into the dry season—woody drupes may remain attached.
- - Observe the canopy density at the end of the dry season for signs of partial leaf drop.
- - Look for purplish flower clusters forming at branch tips during the early wet season.

6. Seasonal Pattern (St. Croix)

- - Jan–Mar: Possible partial leaf drop
- - Apr–May: Flowering and new leaves
- - Jun–Sep: Fruiting
- - Oct–Dec: Stable canopy

Phenological Markers – Ironwood (*Krugiodendron ferreum*)

1. Leaf Behavior

Ironwood is **evergreen**, with **small, thick, leathery leaves** that are **dark green and shiny**.

- Leaves are **opposite** and **oval to oblong**, with a tough texture.
- There is **no distinct seasonal leaf drop**, though older leaves fall intermittently year-round.

Observation Tips:

- Watch for **subtle new leaf flushes**—new leaves may be slightly lighter in color.
- Note that this species maintains a **stable canopy**, even during droughts.

2. Flowering

Flowers are **small, greenish-white**, and usually **inconspicuous**, borne in leaf axils.

- Flowering can occur **multiple times a year**, often triggered by **rainfall events** rather than fixed seasons.
- Individual flowers are **not showy**, but close inspection reveals their presence.

Observation Tips:

- Observe **leaf axils** for small clusters of flowers.
- Flowering may be **sporadic or subtle**, so check regularly during wetter months.

3. Fruiting

Fruits are **small drupes**, about the size of a pea, which **turn dark purple to black when ripe**.

- Fruiting follows flowering and may occur **several times per year**, with small crops.
- The fruit is **eaten by birds**, aiding seed dispersal.

Observation Tips:

- Track **fruit color change**, from green to dark purple/black.
- Monitor for **bird activity** and **fruit drop** under the tree.

4. Growth Habit

Ironwood grows as a **small to medium-sized tree**, typically **10–25 feet tall**, with a **dense, rounded crown**.

- Its name reflects the **exceptionally hard and heavy wood**, which resists decay.
- It is well suited to **dry, rocky, or calcareous soils**, making it ideal for native and drought-tolerant landscapes.

5. Seasonal Pattern (St. Croix)

- **Year-round**: Evergreen leaf cover with slow, steady growth
- **Mar–Oct**: Most likely periods for flowering and fruiting, especially after rains
- **Nov–Feb**: Minimal visible change; canopy remains stable

Phenological Markers – Honduras Mahogany (*Swietenia macrophylla*)

1. Leaf Behavior

This is a **semi-deciduous** tree, typically shedding leaves **briefly during the dry season**.

- Leaves are **compound**, with **large, shiny leaflets** arranged pinnately.
- Leaf drop occurs **late in the dry season (February–March)**, sometimes followed by a near-simultaneous **flush of new reddish-green leaves**.

Observation Tips:

- Note the **timing and completeness of leaf drop**—canopy may briefly appear sparse.
- Document the **color and timing of new leaf flush**, often beginning **just before the first rains**.

2. Flowering

Flowers are **small, greenish-white, and fragrant**, borne in **loose panicles** at branch tips.

- Flowering occurs in the **early wet season**, typically **April to June** in the Virgin Islands.
- Flowers are **insect-pollinated**, especially by **bees and small flies**.

Observation Tips:

- Watch for **emergence of flower panicles**, often concurrent with new leaf growth.
- Record **pollinator activity**, particularly during morning hours.

3. Fruiting

The fruit is a **woody, five-valved capsule**, often called a **mahogany pod**, which splits open at maturity to release **winged seeds**.

- Fruiting begins **after flowering**, with pods developing through the **late wet season (July–October)**.
- Mature pods are **oval to pear-shaped**, turning **brown and splitting open while still on the tree**.

Observation Tips:

- Track **fruit development**, watching for pods **cracking open** at the top.
- Note **seed dispersal**, which relies on **wind to carry seeds away** from the parent tree.

4. Growth Habit
Honduras Mahogany is a **large, straight-trunked tree**, reaching **60–100 feet or more**, with a broad, dome-shaped crown.

- Bark is **grayish and scaly**, and mature trees often have **buttressed roots**.
- Best suited to **moist, well-drained soils**, but adaptable to seasonal dryness.

5. Seasonal Pattern (St. Croix)

- **Jan–Mar**: Leaf shedding (partial to full)
- **Mar–May**: New leaf flush and flowering
- **Jun–Oct**: Fruit development
- **Oct–Dec**: Seed dispersal and canopy maturation