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## BLOOM

*A Farming & Storytelling Experience*

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# 1 Introduction

The project *Bloom* is an atmospheric 2D adventure with farming-simulation elements. The main development goal was to build a reliable item and resource management system and to integrate the story into world exploration.

Set on an isolated, overgrown island, *Bloom* follows a simple core loop: find unique seeds, plant them, and water them regularly to prevent decay. The passage of time and the garden's condition are highlighted through a day/night cycle, subtle effects such as butterflies, and visible crop growth stages.

## 2 Related Work

When designing *Bloom*, we looked at well-known cozy and farming sims like *Stardew Valley* and *Animal Crossing*. These games are strong at long-term game-play loops, but they often focus on constant expansion, economic systems, and ongoing growth.

*Bloom* takes a different approach. Instead of being an economic sandbox, it uses farming mechanics (planting, care, decay) to reflect the player's choices and responsibility. It also relies less on UI menus to deliver story. The narrative is mostly told through in-world elements: a talkative local merchant, hidden diary fragments, and the garden itself as it flourishes or withers. This creates a more focused experience where neglect has clear consequences and visibly affects the game's mood.

## 3 The Original Vision vs. Realized Scope

During the conceptual phase, we envisioned a highly complex and expansive game. However, as development progressed, we were forced to cut a significant amount of our planned narrative and features due to time and organizational constraints.

### 3.1 The Original Storyline & Premise

**Elevator Pitch:** A young botanist is shipwrecked on the mythic Paradise Isle to catalog unknown plants and prove local legends wrong. As his garden flourishes, a dazzling invasive "Bloomvine" offers speed and effortless automation, quietly unbalancing the ecosystem and threatening his way home. The player must choose between fast growth and sustainable care.

**Planned Long-Term Goals:** We originally planned for the player to expand their garden, unlock light automation (watering/nutrient auras), trade with a roaming merchant, craft a "Master Tincture," and face multiple dynamic endings based on an "Invasion Meter" versus a "Biodiversity" percentage.

### 3.2 Scaling Down: What Remained

While the overarching theme of *Greed vs. Harmony* survived, we had to severely reduce the scope. The miracle plant, the Master Tincture, the complex automation elements, and the expansive prologue sequence were cut. Instead, we distilled the game down to its core mechanical essence: a reactive environment where planting, nurturing, and harvesting dictate the narrative of the island.

## 4 Audiovisual Design & Art Direction

The visual and auditory identity of Bloom is defined by detailed, hand-crafted pixel art and immersive soundscapes. Because the game focuses on the delicate balance of nature, the art direction prioritizes organic shapes and a melancholic yet inviting atmosphere.

### 4.1 Color Palette & Environment

We chose a muted, pastel-leaning palette featuring mossy greens, soft ocean teals, and cream tones. This prevents visual fatigue during farming sessions and allows the colors of fully grown plants to stand out significantly.

- **Organic Transitions (Dithering):** The transitions between different biomes, such as grass bleeding into tilled soil, utilize meticulous dithering. This creates a natural, pointillist blending effect rather than harsh, straight lines.
- **Animated Coastlines:** The shores are framed by hand-animated, cascading foam patterns. These light caustics provide a continuous sense of motion that breathes life into the otherwise static edges of the island.
- **Dynamic Depth & Overlap:** By carefully managing the Y-sorting of environmental props, assets such as tall grass, fences, and tree canopies visually break out of their confined grid cells. This strategic overlapping creates a dense, multi-layered environment that feels like a natural, physical space rather than a flat mathematical board.

### 4.2 Plant Design

The game includes six plants (*Aralis*, *Brave Toad*, *Casper*, *Cowhive*, *Grayts*, and *Crying Lassy*). Each one follows its own growth cycle with 6–8 stages, depending on the species.

The mature plants are designed to look both alien and organic so they stand out against the island's muted colors. Instead of standard crops, we mix familiar plant shapes (stems, broad leaves) with unusual details like glowing tips or drooping teal petals. This contrast supports the island's mythic feel and makes the plants feel worth growing.

When a plant is fully grown, the player can either harvest it to make space for new seeds and keep trading, or leave it as a permanent garden decoration. Healthy mature plants also get small visual rewards, like butterflies nearby.

Plants need regular watering. If they aren't watered in time, they start to decay and can eventually die.

### 4.3 UI Design

The UI is designed to feel like a botanist's journal. Main menus like Backpack and Combining use a cream, parchment-like background with ribbon-style navigation to avoid a sterile digital look.

Mechanically, the inventory features a robust **Drag & Drop** system. This functionality is fully usable both within the main backpack for organizing gathered items, and directly across the constant **Hotbar**. The hotbar is directly synchronized with the first 6 slots of the main inventory, providing immediate access to essential tools and seeds.

Outside the main inventory, the HUD stays minimal. A constant Hotbar gives quick access to key tools and seeds, and a subtle Clock shows the day/night cycle and the passage of time without cluttering the screen.

#### 4.4 Audio Design

The game's audio supports the melancholic mood with spatial mixing. Sounds are mostly world-based rather than UI-based. The ocean ambience is distance-driven, getting louder near the coast and fading inland, which helps players orient themselves and stay immersed.

#### 4.5 Asset Creation & Sourcing

To maintain a cohesive art style and ensure the world felt bespoke, the vast majority of visual assets were custom-made by our team specifically for this project:

- **Self-Created Assets:** Light and dark grass tiles, all sand tiles, the complete UI design, all character sprites and animations, all cutscenes, sea tiles (including the blend between the river and the sea), all tree and plant growth stages, all tools and seeds, and generally everything not explicitly listed as external.
- **External Assets (Licensed):** Base river tiles and the small decorative flower tiles on the grass.

### 5 Technical Implementation

#### 5.1 Data-Driven Item System

To manage the items, we implemented a **data-driven design** utilizing *ScriptableObjects* in Unity. Rather than creating a separate prefab for every single item, we utilized one `UniversalPickup` prefab. Leveraging Unity's `OnValidate` method, this prefab reads data from an assigned `ScriptableObject` and instantly updates its sprite and name within the engine.

#### 5.2 The Merchant (TraderNPC)

The *TraderNPC* is the primary voice of the island and acts as the progression anchor. He provides constant feedback through a robust, `ScriptableObject`-based dialogue system. To ensure the player focuses on the information provided, the Trader's movement script halts his wandering and forces him to face the player during any interaction. His shop is gated behind a tiered exchange system; new seeds are only offered once the player has successfully harvested the previous tier's crops.

#### 5.3 Pacing via Delayed Appearance

To manage the density of information and prevent players from being overwhelmed by text, we implemented a **Delayed Appearance** system. Key diary fragments are linked to either real-time timers or the Trader's progression, appearing only after specific seeds have been unlocked, ensuring that the story unfolds in tandem with the player's farming success.

## 6 Controls

*Bloom* is designed to be fully playable with a standard keyboard and mouse setup, focusing on accessible and intuitive inputs:

- **Mouse Click:** Navigate UI menus, choose to continue or start a new game, and interact with inventory slots (Drag & Drop).
- **WASD / Arrow Keys:** Player movement across the island.
- **E:** Interact with the object that is closest to the player (e.g., talk to the Trader, read a diary, use tools on the soil).
- **B:** Open or close the Backpack UI.

## 7 Project Management, Conclusion & Future Work

### 7.1 Team Responsibilities

To ensure a structured development process, responsibilities were divided among the team members based on their individual strengths and technical focus:

- **Yunha Chang:** Tile Design | Plant Design | UI Design | Animations
- **Dalia Salih:** Programming (C#) | Core Loops | Storytelling
- **Venci Wang:** Tile Design | Tool Design | Crafting System | Animations
- **Julia Moor:** Programming (C#) | Worldbuilding | Audio

### 7.2 Honest Learnings

A key part of this project was dealing with the practical side of team-based game development. While we met most of our technical and artistic goals within the revised scope, our organization and workflow caused problems.

- **Scope Management:** We spent too long planning complex narrative arcs before prototyping the core mechanics. We learned that ideas are cheap, but implementation takes time.
- **Version Control (GitHub):** We introduced strict GitHub workflows too late. Trying to merge different versions manually through messaging apps created avoidable issues. A clear repository workflow should be in place from day one.
- **Sprite Standardization:** Inconsistent Pixels Per Unit (PPU) and mismatched pivot points caused major depth-sorting (Y-Sorting) bugs early on. We learned that basic technical art rules, like one shared PPU and bottom-center pivots, need to be defined and enforced from day one.

### 7.3 Future Work: If We Had More Time

Based on the project constraints, there are several clear areas we would expand with more development time. We would prioritize:

- **Original Storyline Integration:** Bringing back Dr. Aiden Vale and the invasive *Bloomvine* to add a stronger conflict between automation and manual care, including multiple endings.
- **Dynamic Weather System:** Adding rain and drought cycles tied directly to the plant decayTimer, so players would need to adjust their watering routines.
- **Expanded Crafting:** Building out the existing *Combining UI* so players can craft upgraded tools (e.g., Dense Pickaxe, Crystal Axe) from collected resources.
- **Wildlife Ecosystem:** Adding animals and insects that respond to the types of plants the player grows, making the island feel more alive.
- **Procedural Exploration:** Adding randomized island expansions or seasonal biome changes to improve replayability and encourage exploration.
- **Deeper NPC Interactions:** Expanding the Trader's dialogue into a friendship/trust system that unlocks lore and late-game items based on player choices.

## 7.4 Conclusion

Despite organizational issues and major cuts to the original storyline, we delivered a technically solid and visually strong slice of our concept. *Bloom* shows how narrative can come from simple, reactive gameplay systems, atmosphere, and sound design.

In the end, the biggest takeaways were practical: clear communication, strict prioritization, and reliable version control from the start matter more for project success than the initial idea.

## 8 Sources & Licenses

- **Unity Engine** - <https://unity.com>
- **Free Unity Assets** - <https://assetstore.unity.com>
- **Free Game Music** - <https://uppbeat.io>