AgriCore
DOCUMENTATION

Hello,

We are proud to present AgriCore, a next-generation farming asset library developed for Unreal Engine. AgriCore has been designed as a modular, performance focused, and production ready solution for developers who aim to create realistic farming environments, large scale open worlds, and cinematic agricultural projects.

This documentation has been prepared to explain AgriCore's structure, material systems, customization options, and recommended usage methods in detail. Our goal is to ensure that AgriCore can be integrated into your projects as smoothly as possible, whether you are developing a game, a simulation, or a cinematic experience.

If you have any questions, requests, or feedback, please do not hesitate to contact us. We provide active support and updates throughout your development process.

We hope that AgriCore becomes a strong foundation for your next project.

Best regards,
CropCraft Team

Package Included

The package contains a total of 70 different products.
 65 of these are crop assets and 5 are mushroom assets.

Each crop follows its own growth logic based on its real world characteristics. AgriCore does not use a single shared growth sequence for all plants. Instead, every crop is built with a specific progression that reflects its natural development.

The growth stages used across the package include Growth, Mature, Flower, Harvest, and Harvested. However, not every crop uses all of these stages. In some crops, the flowering stage appears after the harvest stage. In others, flowering is already part of the mature stage and does not exist as a separate mesh. Some crops only consist of growth and harvest stages. This structure allows each plant to represent its own unique lifecycle.

Common Sprouts assets are included to represent the initial sprouting phase. These meshes can be used across all crops to show early growth in a consistent way.

All crops include dedicated harvest meshes and fruit or product assets. This allows harvested fields, production areas, and post harvest scenes to be created with proper visual continuity.

AgriCore includes an advanced disease system. Each plant has its own disease appearance, and all disease behavior is controlled through a Material Parameter Collection. This allows disease intensity and visibility to be adjusted globally or driven by gameplay systems.

The package contains a total of 414 static meshes.

The majority of plants use opaque materials to ensure the best possible compatibility with Nanite. Masked and two sided materials are intentionally avoided whenever possible for stability and performance reasons. Only a small number of structurally complex plants, such as certain herbs, use masked materials when required.

Most plants are optimized to use a single material slot and a single texture atlas. This approach helps reduce draw calls and keeps performance predictable. Plants that require physical support, such as grape or

cucumber, use an additional material slot dedicated to their support structures.

The cotton harvest stage uses a custom material with a subsurface profile that was specifically prepared for the visual properties of cotton fibers. This material is an exception and exists to achieve more accurate light interaction.

AgriCore includes an advanced wind system. Wind response is calculated based on plant height and structure, allowing short and tall plants to react differently and move in a more natural way.

For Unreal Engine 5.5 and later, AgriCore provides a dedicated PCG system. By placing a single blueprint into the level, a wide variety of field layouts can be generated using three simple selection lists. This allows large farming areas to be created quickly while maintaining control and consistency.

In addition to crops, the package also includes environmental assets such as wild plants, flowers, rocks, and stones to support natural surroundings.

Material System

AgriCore uses a unified material system built on a shared core structure for all plants, with control provided through material instances. The main goal of this system is to maintain visual consistency across the scene while allowing precise adjustments on a per plant basis when needed.

All plants are set up using Basecolor, Normal, and a multi channel Mask texture. The Mask texture contains ambient occlusion, color masking, subsurface scattering intensity, and disease areas within a single atlas. This approach provides an efficient balance between performance and flexibility.

Color and surface properties are managed through material instances. Overall brightness, color balance, saturation, and hue adjustments can be adapted based on scene conditions or artistic requirements. Subsurface scattering and translucency behavior are also controlled at the instance level, allowing different visual responses depending on the structure of each plant.

Lighting response is balanced using parameters such as surface behavior, roughness, and normal intensity. These settings help plants remain readable under different lighting conditions. The system is designed to avoid overly bright or artificial looking results.

Ambient occlusion settings support both overall surface depth and micro detail. AO intensity, contrast, and distance based behavior can be adjusted through the material instance. This helps preserve depth perception, especially in dense field environments.

Wind and deformation behavior is handled through World Position Offset and is fully integrated into the material system. Plant response to wind is calculated based on height and structural properties. Wind influence can be disabled entirely or applied only as a local effect when needed. This allows consistent control in both cinematic scenes and gameplay focused environments.

AgriCore's disease system is also directly integrated into the material setup. Each plant has its own dedicated disease mask. Disease color, coverage area, intensity, and transition behavior are controlled through material instances and the Material Parameter Collection. This allows disease effects to be managed globally or driven by gameplay systems.

The material system is fully compatible with manual placement, the foliage tool, and PCG based workflows. Default values are balanced for direct use in most scenes, while advanced controls remain accessible when deeper customization is required.

Wind

AgriCore uses a vertex based wind system that was built specifically for this ecosystem from the ground up. The system is designed to produce stable, natural looking motion while remaining fully controllable and predictable in large scale scenes.

The wind system supports both global and local wind behavior. Global wind values affect all plants in the scene, while local adjustments can be applied per plant through its material instance. In addition to per instance control, all global wind settings are managed through a Material Parameter Collection, allowing centralized control at the scene or gameplay level.

Wind deformation is calculated using a vertical gradient that runs from the root of the plant to its tip. This gradient defines which parts of the plant are affected by wind and how strongly they respond. The gradient is not fixed and can be adjusted to match different plant structures.

Using the Bend Profile settings, the effective height range of the wind influence can be adjusted. This allows control over how far up the plant the bending effect begins and how it progresses toward the tip.

A Height Offset control is also available to fine tune sensitivity along the gradient. Areas closer to white values are more affected by wind and bend more noticeably, while darker areas remain more rigid and stable. This makes it possible to create clear separation between grounded and flexible parts of the plant.

For debugging and fine tuning, a WPO height debug view can be enabled. This visualization helps verify how the gradient is distributed across the mesh and how wind influence is applied along the plant height.

The wind system is fully integrated into the material setup and works consistently with manual placement, foliage usage, and PCG based workflows.

PCG System (Unreal Engine 5.5+)

AgriCore includes a dedicated PCG workflow for Unreal Engine 5.5 and later. The system is designed to keep field generation simple for the user while preserving detailed, crop specific rules behind the scenes.

Each plant in AgriCore has its own Data Asset that describes how it should behave in a field setup. This asset contains information such as available stages, row area rules, trellis usage, and spacing values. All plant Data Assets are collected under a single main Data Asset, which acts as the central source for the PCG blueprint.

The PCG blueprint reads this structure directly. Plant lists are managed through enums, so the user can select crops and options from clean dropdown menus instead of manually assigning meshes or settings.

To use the system, the user places the AgriCore field blueprint into the level and defines the field size using a spline. From the blueprint details

panel, the user selects the plant type, the desired stage, and the field layout using the provided lists. The field is then generated based on the crop rules stored in the Data Assets.

An optional fence setup is also included. The field can be surrounded by a fence using a single boolean toggle. Variation can be introduced by changing the seed value, allowing the user to generate different results while keeping the same field setup.

This workflow allows large fields to be created quickly, with predictable results and crop specific accuracy, without requiring manual mesh management.

Technical Details & Recommended Usage

AgriCore is designed for Unreal Engine projects that require scalable, performance conscious farming environments. All assets and systems are built with modern Unreal Engine workflows in mind and are suitable for real time use.

Technical Details

- Supported Unreal Engine versions: 5.2 to 5.7

- PCG system support: Unreal Engine 5.5 and later

- Total number of products: 70

    - Crops: 65

    - Mushrooms: 5

- Total number of static meshes: 414

- Most plants use opaque materials to ensure stable Nanite compatibility

- Masked materials are used only where structurally required

- The majority of assets use a single material slot and a single texture atlas

- Plants with support structures use an additional material slot when necessary

- Cotton harvest stage uses a custom subsurface profile material

- Unified material system with instance based control

- Disease system driven by Material Parameter Collection

- Height based wind deformation integrated through World Position Offset

- PCG workflow based on Data Assets, enums, and a single field blueprint

- Spline based field definition with crop specific rules

Recommended Usage

AgriCore is well suited for the following use cases:

- Farming and agriculture focused games

- Open world and survival projects with large outdoor areas

- Simulation projects that require structured crop layouts

- Cinematic scenes and visualization projects

For best results, it is recommended to use AgriCore with Nanite and Lumen enabled. PCG workflows are recommended for large scale fields, while manual or foliage based placement can be used for smaller or more controlled areas.

AgriCore is designed to integrate cleanly into existing projects without enforcing a specific gameplay structure, allowing developers to adapt the system to their own needs.

Note: All objects in the package utilize Nanite, When using this package with Unreal Engine 5.2 and above, it is strongly recommended to utilize the Nanite and Lumen systems.

https://docs.unrealengine.com/5.0/en-US/lumen-global-illumination-and-reflections-in-unreal-engine/