



# 1 Plantain

## Properties (Outputs)

Name	Description	Units	Type	Settable?
AboveGround	Above ground weight		IBiomass	True
AboveGroundHarvestable	Above ground weight		IBiomass	False
AssimilateAvailable	Amount of assimilate available to be damaged.		double	False
CoverGreen	Total plant green cover from all organs	-	double	False
CoverTotal	Total plant cover from all organs	-	double	False
CultivarNames	Gets a list of cultivar names		String	False
DaysAfterEnding	Counter for the number of days after crop being ended.  Used to clean up data the day after an EndCrop, enabling some reporting.	d	int32	True
DaysAfterSowing	Number of days after sowing.	d	int32	False
IsAlive	Return true if plant is alive and in the ground.		boolean	True
IsEmerged	Return true if plant has emerged		boolean	False
IsEnding	Returns true if the crop is being ended.  Used to clean up data the day after an EndCrop, enabling some reporting.		boolean	True

Name	Description	Units	Type	Settable?
IsReadyForHarvest	Returns true if the crop is ready for harvesting		boolean	False
LAI	Leaf area index.	m <sup>2</sup> /m <sup>2</sup>	double	False
Material	A list of material (biomass) that can be damaged.		IEnumerable< <a href="#">DamageableBiomass</a> >	False
NitrogenUptake	The nitrogen uptake		double	False
Organs	Gets the organs.		IOrgan	True
PlantType	Used by several organs to determine the type of crop.		String	True
Population	Gets or sets the plant population.	/m <sup>2</sup>	double	True
SowingData	The sowing data		<a href="#">SowingParameters</a>	True
SowingDate	Holds the date of sowing		datetime	True
WaterUptake	The sw uptake		double	False

#### Links (Dependencies)

Name	Type	IsOptional?
Arbitrator	IArbitrator	True
clock	IClock	False
Leaf	ICanopy	True
mortalityRate	IFunction	False
Phenology	IPhenology	False
Root	IRoot	True
structure	IStructure	True
summary	ISummary	False

#### Events published

Name	Type
Cutting	Void Cutting (Object sender, EventArgs e)
Flowering	Void Flowering (Object sender, EventArgs e)
Grazing	Void Grazing (Object sender, EventArgs e)
Harvesting	Void Harvesting (Object sender, EventArgs e)
LeafPlucking	Void LeafPlucking (Object sender, EventArgs e)
PlantEnding	Void PlantEnding (Object sender, EventArgs e)
PlantSowing	Void PlantSowing (Object sender, <a href="#">SowingParameters</a> e)
Pruning	Void Pruning (Object sender, EventArgs e)
Sowing	Void Sowing (Object sender, EventArgs e)

#### Methods (callable from manager)

Name	Description
Document	ITag Document()
EndCrop	void EndCrop()
Harvest	void Harvest()
Harvest	void Harvest( <a href="#">RemovalFractions</a> removalData) <i>Harvest the crop.</i>
ReduceCanopy	void ReduceCanopy(double deltaLAI) <i>Set the plant leaf area index.</i>
ReducePopulation	void ReducePopulation(double newPlantPopulation) <i>Reduce the plant population.</i>
ReduceRootLengthDensity	void ReduceRootLengthDensity(double rootLengthModifier) <i>Set the plant root length density.</i>

Name	Description
RemoveAssimilate	void RemoveAssimilate(double deltaAssimilate) <i>Remove an amount of assimilate from the plant.</i>
RemoveBiomass	void RemoveBiomass(String biomassRemoveType, RemovalFractions removalData) <i>Harvest the crop.</i>
RemoveBiomass	void RemoveBiomass(String organName, String biomassRemoveType, OrganBiomassRemovalType biomassToRemove) <i>Remove biomass from an organ.</i>
SetEmergenceDate	void SetEmergenceDate(String emergencedate) <i>Force emergence on the date called if emergence has not occurred already</i>
SetGerminationDate	void SetGerminationDate(String germinationdate) <i>Force germination on the date called if germination has not occurred already</i>
Sow	void Sow(String cultivar, double population, double depth, double rowSpacing, double maxCover, double budNumber, double rowConfig) <i>Sow the crop with the specified parameters.</i>

## 2 SowingParameters

Parameters which control how a plant is sown.

### Properties (Outputs)

Name	Description	Units	Type	Settable?
BudNumber	The bud number		double	True
Cultivar	The cultivar to be sown.		String	True
Depth	The depth	mm	double	True
MaxCover	The maximum cover		double	True
Population	The population.	/m2	double	True

Name	Description	Units	Type	Settable?
RowSpacing	The row spacing	mm	double	True
SkipDensityScale	The skip plant seed density adjustment		double	True
SkipPlant	The skip plant		double	True
SkipRow	The skip row		double	True
SkipType	The skip type		double	True

### 3 DamageableBiomass

A class to hold a mass of biomass and its digestibility.

#### Properties (Outputs)

Name	Description	Units	Type	Settable?
Consumable	Consumable Biomass (kg/ha)		Biomass	False
Digestibility	Optional digestibility (0-1). Can be null missing digestibility.		nullable`1	False
IsLive	Is biomass live.		boolean	False
Name	Name of material.		String	False
Total	Total Biomass (kg/ha)		Biomass	False

### 4 RemovalFractions

Data structure to hold removal and residue returns fractions for all plant organs

#### Properties (Outputs)

Name	Description	Units	Type	Settable?
NodesToRemove	The number of Main-stem nodes to remove		int32	True
SetPhenologyStage	The Phenological stage that biomass removal resets phenology to.		double	True
SetThinningProportion	The Phenological stage that biomass removal resets phenology to.		double	True

#### Methods (callable from manager)

Name	Description
GetFractionsForOrgan	<a href="#">OrganBiomassRemovalType</a> GetFractionsForOrgan(String organName) <i>Gets the removal fractions for the specified organ or null if not found.</i>
SetFractionToRemove	void SetFractionToRemove(String organName, double fraction, String biomassType) <i>Method to set the FractionToRemove for specified Organ</i>
SetFractionToResidue	void SetFractionToResidue(String organName, double fraction, String biomassType) <i>Method to set the FractionToResidue for specified Organ</i>

## 5 OrganBiomassRemovalType

Data passed to each organ when a biomass remove event occurs. The proportion of biomass to be removed from each organ is the sum of the FractionToRemove and the FractionToResidues

### Properties (Outputs)

Name	Description	Unit	Type	Settable?
FractionDeadToRemove	Amount of dead biomass taken from each organ and removed from the zone on harvest, cut, graze or prune.		double	True
FractionDeadToResidue	Amount of dead biomass to removed from each organ and passed to residue pool on on harvest, cut, graze or prune		double	True
FractionLiveToRemove	Amount of live biomass taken from each organ and removed from the zone on harvest, cut, graze or prune.		double	True
FractionLiveToResidue	Amount of live biomass to removed from each organ and passed to residue pool on on harvest, cut, graze or prune		double	True