



1 SCRUM

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 |
| IsEmerging | 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 ² /m ² | double | False |
| Material | A list of material (biomass) that can be damaged. | | IEnumerable< DamageableBiomass > | 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 ² | double | True |
| SowingData | The sowing data | | SowingParameters | 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, SowingParameters 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(RemovalFractions 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 | OrganBiomassRemovalType 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 | Remove amount of dead biomass taken from each organ and removed from the zone on harvest, cut, graze or prune. | | double | True |
| FractionDeadToResidue | Residue amount of dead biomass to removed from each organ and passed to residue pool on on harvest, cut, graze or prune | | double | True |
| FractionLiveToRemove | Remove amount of live biomass taken from each organ and removed from the zone on harvest, cut, graze or prune. | | double | True |
| FractionLiveToResidue | Residue amount of live biomass to removed from each organ and passed to residue pool on on harvest, cut, graze or prune | | double | True |