



## 1 Pinus

### Properties (Outputs)

Name	Description	Units	Type	Settable?
AboveGround	Above ground weight		IBiomass	True
AboveGroundHarvestable	Above ground weight		IBiomass	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
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
IsReadyForHarvesting	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

Name	Description	Units	Type	Settable?
NitrogenUptake	The nitrogen uptake		double	False
PlantType	Used by several organs to determine the type of crop.		String	True
Population	Gets or sets the plant population.	/m2	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	<a href="#">Phenology</a>	False
Root	IRoot	True
seedMortalityRate	IFunction	False
structure	IStructure	True
summary	ISummary	False

#### Events published

Name	Type
Flowering	Void Flowering (Object sender, EventArgs e)
Harvesting	Void Harvesting (Object sender, EventArgs e)

Name	Type
PlantEnding	Void PlantEnding (Object sender, EventArgs e)
PlantSowing	Void PlantSowing (Object sender, <a href="#">SowingParameters</a> e)
Sowing	Void Sowing (Object sender, EventArgs e)
StartPodDevelopment	Void StartPodDevelopment (Object sender, EventArgs e)

#### Methods (callable from manager)

Name	Description
Document	ITag Document()
EndCrop	void EndCrop()
Harvest	void Harvest(boolean removeBiomassFromOrgans) <i>Harvest the crop.</i>
ReducePopulation	void ReducePopulation(double newPlantPopulation) <i>Reduce the plant population.</i>
Sow	void Sow(String cultivar, double population, double depth, double rowSpacing, double maxCover, double budNumber, double rowConfig, double seeds, int32 tillering, double ftn) <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
FTN	Fertile Tiller Number		double	True

Name	Description	Units	Type	Settable?
MaxCover	The maximum cover		double	True
Population	The population.	/m2	double	True
RowSpacing	The row spacing	mm	double	True
Seeds	The number of seeds sown.		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
TilleringMethod	Tillering Method to set Fixed or dynamic tillering		int32	True

### 3 Phenology

The phenological development is simulated as the progression through a series of developmental phases, each bound by distinct growth stage.

#### Properties (Outputs)

Name	Description	Units	Type	Settable?
AccumulatedEmergedTT	The Thermal time accumulated tt following emergence		double	True
AccumulatedTT	The Thermal time accumulated tt		double	True
CurrentPhase	A utility property to return the current phase.		IPhase	False
CurrentPhaseName	This property is used to retrieve or set the current phase name.		String	False
CurrentStageName	Return current stage name.		String	False
Emerged	The emerged		boolean	False
FractionInCurrentPhase	Gets the fraction in current phase.		double	False
Stage	A one based stage number.		double	True

Name	Description	Units	Type	Settable?
StageCodes	List of numerical stage codes		int32	False
StageNames	List of stages in phenology		String	False
Zadok	Gets the current zadok stage number. Used in manager scripts.		double	False

#### Links (Dependencies)

Name	Type	IsOptional?
age	<a href="#">Age</a>	True
plant	<a href="#">Plant</a>	False
thermalTime	IFunction	False
zadok	<a href="#">ZadokPMFWheat</a>	True

#### Events published

Name	Type
PhaseChanged	Void PhaseChanged (Object sender, <a href="#">PhaseChangedType</a> e)
PlantEmerged	Void PlantEmerged (Object sender, EventArgs e)
PostPhenology	Void PostPhenology (Object sender, EventArgs e)
StageWasReset	Void StageWasReset (Object sender, <a href="#">StageSetType</a> e)

#### Methods (callable from manager)

Name	Description
BeforePhase	boolean BeforePhase(int32 phaseIndex)  <i>A utility function to return true if the simulation is before the specified phaseIndex.</i>
Between	boolean Between(int32 startPhaseIndex, int32 endPhaseIndex)  <i>A utility function to return true if the simulation is currently between the specified start and end stages.</i>

Name	Description
Between	boolean Between(String start, String end) <i>A utility function to return true if the simulation is currently between the specified start and end stages.</i>
Beyond	boolean Beyond(String start) <i>A utility function to return true if the simulation is at or past the specified start stage.</i>
BeyondPhase	boolean BeyondPhase(int32 phaseIndex) <i>A utility function to return true if the simulation is at or past the specified start stage.</i>
Document	ITag Document()
EndStagePhaseIndex	int32 EndStagePhaseIndex(String stageName) <i>Look for a particular stage and return its index or -1 if not found.</i>
GetPhaseTable	DataTable GetPhaseTable()
IndexFromPhaseName	int32 IndexFromPhaseName(String name) <i>Look for a particular phase and return its index or -1 if not found.</i>
InPhase	boolean InPhase(String phaseName) <i>A utility function to return true if the simulation is currently in the specified phase.</i>
OnCreated	void OnCreated()
OnStartDayOf	boolean OnStartDayOf(String stageName) <i>A utility function to return true if the simulation is on the first day of the specified stage.</i>
PhaseStartingWith	IPhase PhaseStartingWith(String start) <i>A utility function to return the phenological phase that starts with the specified start stage name.</i>

Name	Description
ResetCampVernParams	void ResetCampVernParams( <a href="#">FinalLeafNumberSet</a> overRideFLNParams)  <i>Resets the Vrn expression parameters for the CAMP model</i>
SetAge	void SetAge(double newAge)  <i>Allows setting of age if phenology has an age child</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>
SetToEndStage	void SetToEndStage()
SetToStage	void SetToStage(double newStage)  <i>A function that resets phenology to a specified stage</i>
StartStagePhaseIndex	int32 StartStagePhaseIndex(String stageName)  <i>Look for a particular stage and return it's index or -1 if not found.</i>