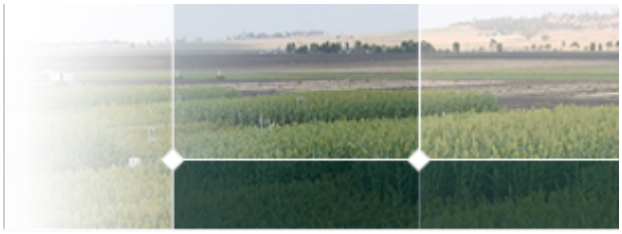


1 The APSIM SCRUM Model

1.1 SCRUM: the Simple Crop Resource Uptake Model

Hamish Brown and Rob Zyskowski, Plant and Food Research, New Zealand

This model has been built using the Plant Modelling Framework (PMF) of Brown et al., 2014 to simulate a range of different crops in simulations where water and nitrogen balance are of interest but a fully mechanistic plant model is not needed or is not available. It is a daily time step implementation of the crop model that is used on the Overseer nutrient balance model Cichota et al., 2010. It uses simple sigmoidal functions for estimating daily cover and biomass deltas to give realistic water and nitrogen demands. It does not simulate potential yield, this is specified as an input. Yield will be reduced below the specified potential yield if N or water supplies from the soil are insufficient to meet demand. The model has been paramaterised for simulating water and nitrogen balances of cropping rotations in New Zealand (where over 50 different crop types are grown and it is not feasible to produce full crop models for each of these). Because of this the model is not as generically applicable as full APSIM crop models. It may be adapted for other purposes and other crop types may be added but the user will need to keep in mind that because it is a simple model the the parameters might need changing for crops in different locations or for crops sown at different times of the year. Some sensibility testing or validation is recommended before application in different sutuations.

SCRUM has a simple phenology model which divides the crop growth into three main phases; a vegetative phase when the canopy is expanding, a reproductive phase when product is being formed and a senescing phase when the canopy is contracting. SCRUM has 4 organ classes to represent different biomass components and the real biomass components that these classes represent changes from crop to crop:

1. A Simple leaf class called Stover which represents the unharvested parts of the plant. Generally, this represents the leaf and stem components of the crop but for crops where stem and leaf are part of the harvested product (e.g forages and leafy vegetables) than stover is the residual fraction of leaf and stem that is not harvested.
2. A Generic organ class called Product which represents the plant parts that are harvested and removed from the field. This could represent grain, fruits, tubers, leaf or stem depending on what sort of crop is being represented.
3. A Root organ which extracts water and nitrogen from the soil for plant growth and returns biomass to the soil on harvest
4. A Nodule organ which is only activated and fixes nitrogen for the legume crops.

An Arbitrator is also included which determines the allocation of drymatter and nitrogen biomass between each of these organs.

#Inclusion in APSIM simulations A scrum crop is included in a simulation the same as any other APSIM crop

* The SCRUM object needs to be dragged or copied from the Crop folder in the tool box into the field of your simulation.
* It is then planted with a sowing rule

```
SCRUM.Sow(cultivar: Wheat_Autumn, population: 1, depth: 10, rowSpacing: 150);
```

* Note that SCRUM has no notion of population or rowSpacing but these parameters are required by the Sow method so filler values are provided
* To specify an expected Expected Yield that differs to the defalt value provided, included the following code in a manager script to be executed on the day of sowing.

```
zone.Set("[SCRUM].Product.ExpectedYield.Value()", ResetValue);
```

* SCRUM can be Harvested, Cut, Grazed and Pruned like other crops. Defalt proportions of the biomass in each organ are removed from the sysem and/or added to the fields residue pools. Note that defalt removal fraction for product on harvest is 0 (becaue it is represented with a generic organ) so more appropriate removal fractions should be sepcified in a manager script as follows:

```
[EventSubscribe("Commencing")]
private void OnSimulationCommencing(object sender, EventArgs e)
{
Remove = new RemovalFractions(SCRUM.Organs);
}
[EventSubscribe("DoManagement")]
private void OnDoManagement(object sender, EventArgs e)
{
if (Clock.Today.Date == HarvestDate2)
{
Remove.SetFractionLiveToRemove("Product", 1.0);
Remove.SetFractionLiveToRemove("Stover", 0.05);
Remove.SetFractionLiveToResidue("Stover",0.95)
SCRUM.Harvest(Remove);
SCRUM.EndCrop();
}
}
```

* A Remove class as shown above can be sent with Harvest, Cut, Graze and Prune events to specificy the proportions of removals.
* Once a crop has been ended the field is open to plant another crop using another APSIM crop model or sowing another SCRUM crop.

The model has been developed using the Plant Modelling Framework (PMF) of Brown et al., 2014. This new framework provides a library of plant organ and process submodels that can be coupled, at runtime, to construct a model in much the same way that models can be coupled to construct a simulation.This means that dynamic composition of lower level process and organ classes(e.g.photosynthesis, leaf) into larger constructions(e.g.maize, wheat, sorghum) can be achieved by the model developer without additional coding.

The model is constructed from the following list of software components. Details of the implementation and model parameterisation are provided in the following sections.

List of Plant Model Components.

Component Name	Component Type
Phenology	Models.PMF.Phen.Phenology
Arbitrator	Models.PMF.OrganArbitrator
Product	Models.PMF.Organs.GenericOrgan
Stover	Models.PMF.Organs.SimpleLeaf
Root	Models.PMF.Organs.Root
Nodule	Models.PMF.Organs.Nodule
MortalityRate	Models.Functions.Constant

1.2 Phenology

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

As ThermalTime accumulates the crop progresses through the following phases:

1.2.1 ThermalTime

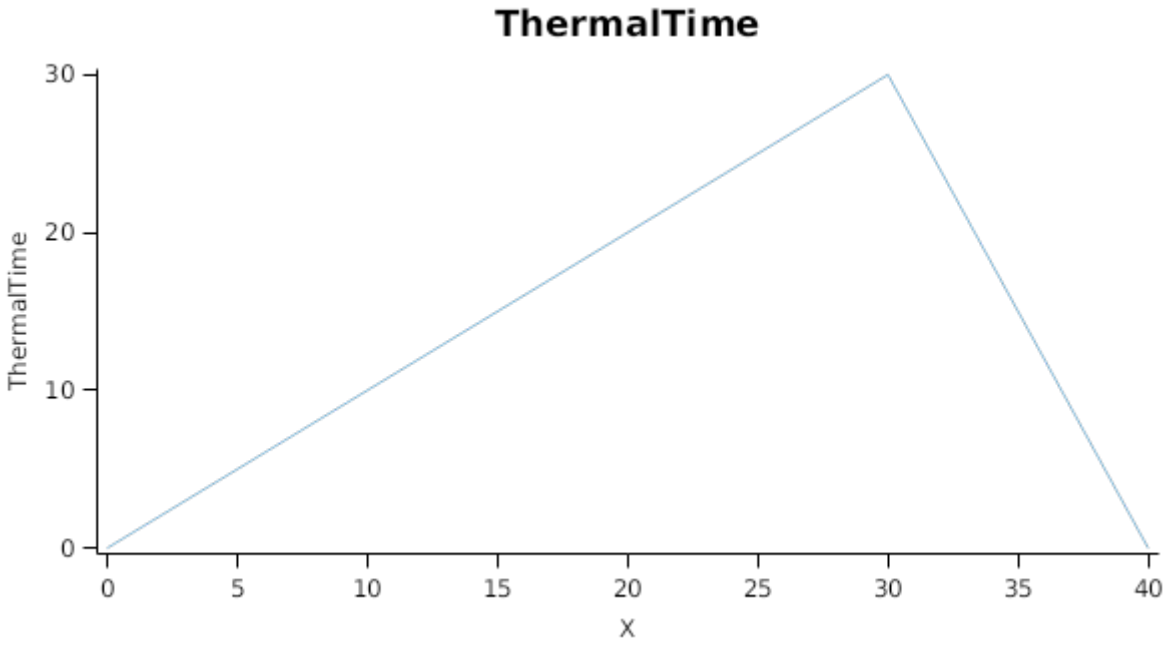
ThermalTime is the average of sub-daily values from a XYPairs.

Progression through each of the phenological stages is driven by thermal time. As temperature increases from zero to 30 degrees, development acelerates and then slows down again above 30 degress

Firstly 3-hourly estimates of air temperature (Ta) are interpolated using the method of Jones et al., 1986 which assumes a sinusoidal temperature. pattern between Tmax and Tmin.

Each of the interpolated air temperatures are then passed into the following Response and the Average taken to give daily ThermalTime

X	ThermalTime
0.0	0.0
30.0	30.0
40.0	0.0



List of stages and phases used in the simulation of crop phenological development

Phase Number	Phase Name	Initial Stage	Final Stage
1	Germinating	Sowing	Germination
2	Emerging	Germination	Emergence
3	CanopyExpanding	Emergence	StartReproductive
4	YieldIncreasing	StartReproductive	StartSenescence
5	Senescing	StartSenescence	EndReproductive
6	Mature	EndReproductive	Maturity
7	ReadyForHarvesting	Maturity	Unused

1.2.2 Germinating

The phase goes from sowing to germination and assumes germination will be reached on the day after sowing or the first day thereafter when the extractable soil water at sowing depth is greater than zero.

1.2.3 Emerging

This phase goes from germination to emergence and simulates time to emergence as a function of sowing depth. The *ThermalTime Target* for ending this phase is given by:

Target = *SowingDepth* x *ShootRate* + *ShootLag*

Where:

ShootRate = 0 (deg day/mm),

ShootLag = 0 (deg day),

SowingDepth (mm) is sent from the manager with the sowing event.

Currently the duration of the Emergence phase is set to zero because the period of zero cover and biomass production following sowing is accounted for in the cover and biomass accumulation functions. However this phase is included if parameterisations of other crops in the future wish to give this phase a duration.

Progress toward emergence is driven by thermal time accumulation, where thermal time is calculated as:

ThermalTime = [Phenology].ThermalTime

1.2.4 CanopyExpanding

This phase goes from emergence to startreproductive.

During this phase the plant only partitions biomass to Root and Stover (leaf and stem) Organs

The *Target* for completion is calculated as:

Target = 1000 (^oCd)

Progression through phase is calculated daily and accumulated until the *Target* is reached.

Progression = [Phenology].ThermalTime

1.2.5 YieldIncreasing

This phase goes from startreproductive to startsenescence.

During this phase the plant is partitioning biomass to Root, Stover and Product organs.

The *Target* for completion is calculated as:

Target = 600 (^oCd)

Progression through phase is calculated daily and accumulated until the *Target* is reached.

Progression = [Phenology].ThermalTime

1.2.6 Senescing

This phase goes from startsenescence to endreproductive.

During this phase the plant is partitioning biomass to Root and Product organs and the canopy cover decreases from its maximum to zero

The *Target* for completion is calculated as:

Target = 600 (^oCd)

Progression through phase is calculated daily and accumulated until the *Target* is reached.

Progression = [Phenology].ThermalTime

1.2.7 Mature

This phase goes from endreproductive to maturity.

During this phase the plant has completed its growth and is drying ready for harvest.

The *Target* for completion is calculated as:

Target = 600 (^oCd)

Progression through phase is calculated daily and accumulated until the *Target* is reached.

Progression = [Phenology].ThermalTime

1.2.8 ReadyForHarvesting

It is the end phase in phenology and the crop will sit, unchanging, in this phase until it is harvested or removed by other method

1.3 Arbitrator

1.3.1 Arbitrator

The Arbitrator class determines the allocation of dry matter (DM) and Nitrogen between each of the organs in the crop model. Each organ can have up to three different pools of biomass:

* **Structural biomass** which is essential for growth and remains within the organ once it is allocated there.
* **Metabolic biomass** which generally remains within an organ but is able to be re-allocated when the organ senesces and may be retranslocated when demand is high relative to supply.
* **Storage biomass** which is partitioned to organs when supply is high relative to demand and is available for retranslocation to other organs whenever supply from uptake, fixation, or re-allocation is lower than demand.

The process followed for biomass arbitration is shown in the figure below. Arbitration calculations are triggered by a series of events (shown below) that are raised every day. For these calculations, at each step the Arbitrator exchange information with each organ, so the basic computations of demand and supply are done at the organ level, using their specific parameters.

1. **doPotentialPlantGrowth**. When this event occurs, each organ class executes code to determine their potential growth, biomass supplies and demands. In addition to demands for structural, non-structural and metabolic biomass (DM and N) each organ may have the following biomass supplies:

* **Fixation supply**. From photosynthesis (DM) or symbiotic fixation (N)
* **Uptake supply**. Typically uptake of N from the soil by the roots but could also be uptake by other organs (eg foliage application of N).
* **Retranslocation supply**. Storage biomass that may be moved from organs to meet demands of other organs.
* **Reallocation supply**. Biomass that can be moved from senescing organs to meet the demands of other organs.

1. **doPotentialPlantPartitioning.** On this event the Arbitrator first executes the DoDMSetup() method to gather the DM supplies and demands from each organ, these values are computed at the organ level. It then executes the DoPotentialDMAllocation() method which works out how much biomass each organ would be allocated assuming N supply is not limiting and sends these allocations to the organs. Each organ then uses their potential DM allocation to determine their N demand (how much N is needed to produce that much DM) and the arbitrator calls DoNSetup() to gather the N supplies and demands from each organ and begin N arbitration. Firstly DoNReallocation() is called to redistribute N that the plant has available from senescing organs. After this step any unmet N demand is considered as plant demand for N uptake from the soil (N Uptake Demand).
2. **doNutrientArbitration.** When this event occurs, the soil arbitrator gets the N uptake demands from each plant (where multiple plants are growing in competition) and their potential uptake from the soil and determines how much of their demand that the soil is able to provide. This value is then passed back to each plant instance as their Nuptake and doNUptakeAllocation() is called to distribute this N between organs.
3. **doActualPlantPartitioning.** On this event the arbitrator call DoNRetranslocation() and DoNFixation() to satisfy any unmet N demands from these sources. Finally, DoActualDMAllocation is called where DM allocations to each organ are reduced if the N allocation is insufficient to achieve the organs minimum N concentration and final allocations are sent to organs.

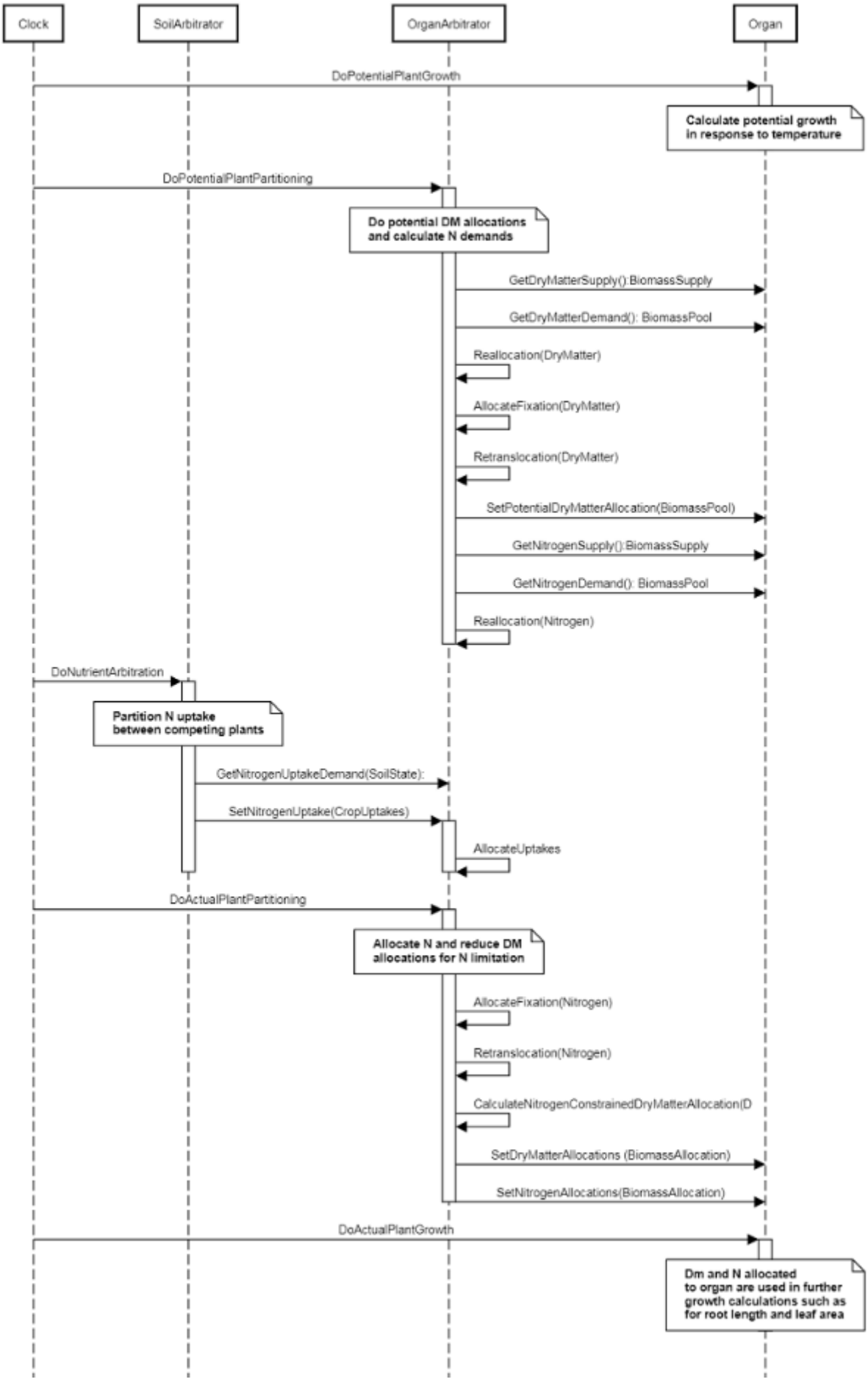


Figure 1: Schematic showing the procedure for arbitration of biomass partitioning. Pink boxes represent events that occur every day and their numbering shows the order of calculations. Blue boxes represent the methods that are called when these events occur. Orange boxes contain properties that make up the organ/arbitrator interface. Green boxes are organ specific properties.

1.4 Product

1.4.1 Product

This organ is simulated using a GenericOrgan type. It is parameterised to calculate the growth, senescence, and detachment of any organ that does not have specific functions.

1.4.2 Dry Matter Demand

The dry matter demand for the organ is calculated as defined in DMDemands, based on the DMDemandFunction and partition fractions for each biomass pool.

1.4.2.1 DMDemands

This class holds the functions for calculating the absolute demands and priorities for each biomass fraction.

Structural = *DMDemandFunction* x *StructuralFraction*

Returns the product of its PartitionFraction and the total DM supplied to the arbitrator by all organs.

DMDemandFunction = PartitionFraction x [Arbitrator].DM.TotalFixationSupply

PartitionFraction is calculated using specific values or functions for various growth phases. The function will use a value of zero for phases not specified below.

YieldIncreasing has a value between StartReproductive and StartSenescence calculated as:

ProductProportion = 1 - [Root].RootProportion - [Stover]
.DMDemands.Structural.DMDemandFunction.PartitionFraction.YieldIncreasing

Senescing has a value between StartSenescence and EndReproductive calculated as:

StoverFraction = 1 - [Root].RootProportion

StructuralFraction = 1 (0-1)

Metabolic = 0

The partitioning of daily growth to storage biomass is based on a storage fraction.

StorageFraction = 1 - [Product].DMDemands.Structural.StructuralFraction

QStructuralPriority = 1

QMetabolicPriority = 1

QStoragePriority = 1

1.4.3 Nitrogen Demand

The N demand is calculated as defined in NDemands, based on DM demand the N concentration of each biomass pool.

1.4.3.1 NDemands

This class holds the functions for calculating the absolute demands and priorities for each biomass fraction.

Structural = [Product].minimumNconc x [Product].potentialDMAllocation.Structural

Metabolic = *MetabolicNconc* x [Product].potentialDMAllocation.Structural

MetabolicNconc = [Product].criticalNConc - [Product].minimumNconc

The partitioning of daily N supply to storage N attempts to bring the organ's N content to the maximum concentration.

Storage = [Product].maximumNconc × ([Product].Live.Wt + potentialAllocationWt) - [Product].Live.N

The demand for storage N is further reduced by a factor specified by the [Product].NitrogenDemandSwitch.

NitrogenDemandSwitch = [Product].nitrogenDemandSwitch

MaxNconc = [Product].maximumNconc

QStructuralPriority = 1

QMetabolicPriority = 1

QStoragePriority = 1

1.4.4 N Concentration Thresholds

MinimumNConc = 0.008

CriticalNConc = [Product].MinimumNConc

MaximumNConc = 0.012

1.4.5 Dry Matter Supply

Product does not reallocate DM when senescence of the organ occurs.

Product does not retranslocate non-structural DM.

1.4.6 Nitrogen Supply

Product does not reallocate N when senescence of the organ occurs.

Product does not retranslocate non-structural N.

1.4.7 Senescence and Detachment

Product has senescence parameterised to zero so all biomass in this organ will remain alive.

Product has detachment parameterised to zero so all biomass in this organ will remain with the plant until a defoliation or harvest event occurs.

This organ will respond to certain management actions by either removing some of its biomass from the system or transferring some of its biomass to the soil surface residues. The following table describes the default proportions of live and dead biomass that are transferred out of the simulation using "Removed" or to soil surface residue using "To Residue" for a range of management actions. The total percentage removed for live or dead must not exceed 100%. The difference between the total and 100% gives the biomass remaining on the plant. These can be changed during a simulation using a manager script.

Method	% Live Removed	% Dead Removed	% Live To Residue	% Dead To Residue
Harvest	50	0	10	0
Cut	80	0	0	0
Prune	0	0	60	0
Graze	60	0	20	0

1.5 Stover

This organ is simulated using a SimpleLeaf organ type. It provides the core functions of intercepting radiation, producing biomass through photosynthesis, and determining the plant's transpiration demand. The model also calculates the growth, senescence, and detachment of leaves. SimpleLeaf does not distinguish leaf cohorts by age or position in the canopy.

Radiation interception and transpiration demand are computed by the MicroClimate model. This model takes into account competition between different plants when more than one is present in the simulation. The values of canopy Cover, LAI, and plant Height (as defined below) are passed daily by SimpleLeaf to the MicroClimate model. MicroClimate uses an implementation of the Beer-Lambert equation to compute light interception and the Penman-Monteith equation to calculate potential evapotranspiration.
These values are then given back to SimpleLeaf which uses them to calculate photosynthesis and soil water demand.

NOTE: the summary above is used in the Apsim's autodoc.

SimpleLeaf has two options to define the canopy: the user can either supply a function describing LAI or a function describing canopy cover directly. From either of these functions SimpleLeaf can obtain the other property using the Beer-Lambert equation with the specified value of extinction coefficient. The effect of growth rate on transpiration is captured by the Fractional Growth Rate (FRGR) function, which is passed to the MicroClimate model.

Stover represents any part of the crop that is not removed at harvest (i.e not part of the product).

1.5.1 Initial Dry Matter

InitialWt = *InitialPlantWt* x [Plant].Population

InitialPlantWt = 0 (g/plant)

1.5.2 Dry Matter Demand

The dry matter demand for the organ is calculated as defined in DMDemands, based on the DMDemandFunction and partition fractions for each biomass pool.

1.5.2.1 DMDemands

This class holds the functions for calculating the absolute demands and priorities for each biomass fraction.

Structural = *DMDemandFunction* x *StructuralFraction*

Returns the product of its PartitionFraction and the total DM supplied to the arbitrator by all organs.

DMDemandFunction = *PartitionFraction x [Arbitrator].DM.TotalFixationSupply*

DM demand is based on a simple partitioning coefficients. At harvest the biomass partitioned to the stover = TotalDM * (1 - RootProportion) * (1 - Harvest index). However the partitioningFraction is more complicated that this as it partitions more biomass to the stover in the CanopyExpanding Phase and less in the Yield increasing phase to give realistic patterns of accumulation of biomass in the Stover and Product over the duration of the crop

PartitionFraction is calculated using specific values or functions for various growth phases. The function will use a value of zero for phases not specified below.

Expanding has a value between Emergence and StartReproductive calculated as:

DMPartitionCoefficient = 1 - [Root].RootProportion

YieldIncreasing has a value between StartReproductive and StartSenescence calculated as:

DMPartitionCoefficient = *StoverBiomass* / *TotalBiomass*

StoverBiomass = *StoverAtMaturity* - *StoverAtStartReproductive*

StoverAtMaturity = *AboveGroundProportion* x *StoverProportion* x [Stover].TotalBiomassAtMaturity

AboveGroundProportion = 1 - [Root].RootProportion

StoverProportion = 1 - [Product].HarvestIndex

StoverAtStartReproductive = [Stover].TotalBiomassAtStartReproductive x *AboveGroundProportion*

AboveGroundProportion = 1 - [Root].RootProportion

TotalBiomass = [Stover].TotalBiomassAtStartSenescence - [Stover].TotalBiomassAtStartReproductive

StructuralFraction = 1 (0-1)

Metabolic = 0

The partitioning of daily growth to storage biomass is based on a storage fraction.

StorageFraction = 1 - [Stover].DMDemands.Structural.StructuralFraction

QStructuralPriority = 1

QMetabolicPriority = 1

QStoragePriority = 1

1.5.3 Nitrogen Demand

The N demand is calculated as defined in NDemands, based on DM demand the N concentration of each biomass pool.

1.5.3.1 NDemands

This class holds the functions for calculating the absolute demands and priorities for each biomass fraction.

Structural = [Stover].minimumNconc x [Stover].potentialDMAllocation.Structural

Metabolic = *MetabolicNconc* x [Stover].potentialDMAllocation.Structural

MetabolicNconc = [Stover].criticalNConc - [Stover].minimumNconc

The partitioning of daily N supply to storage N attempts to bring the organ's N content to the maximum concentration.

Storage = [Stover].maximumNconc × ([Stover].Live.Wt + potentialAllocationWt) - [Stover].Live.N

The demand for storage N is further reduced by a factor specified by the [Stover].NitrogenDemandSwitch.

NitrogenDemandSwitch = [Stover].nitrogenDemandSwitch

MaxNconc = [Stover].maximumNconc

QStructuralPriority = 1

QMetabolicPriority = 1

QStoragePriority = 1

1.5.4 Nitrogen Concentration Thresholds

The N demand is calculated as defined in NDemands, based on DM demand the N concentration of each biomass pool.

1.5.4.1 NDemands

This class holds the functions for calculating the absolute demands and priorities for each biomass fraction.

Structural = [Stover].minimumNconc x [Stover].potentialDMAllocation.Structural

Metabolic = *MetabolicNconc* x [Stover].potentialDMAllocation.Structural

MetabolicNconc = [Stover].criticalNConc - [Stover].minimumNconc

The partitioning of daily N supply to storage N attempts to bring the organ's N content to the maximum concentration.

Storage = [Stover].maximumNconc × ([Stover].Live.Wt + potentialAllocationWt) - [Stover].Live.N

The demand for storage N is further reduced by a factor specified by the [Stover].NitrogenDemandSwitch.

NitrogenDemandSwitch = [Stover].nitrogenDemandSwitch

MaxNconc = [Stover].maximumNconc

QStructuralPriority = 1

QMetabolicPriority = 1

QStoragePriority = 1

1.5.5 Dry Matter Supply

DMReallocationFactor = 0

DMRetranslocationFactor = 0

1.5.6 Photosynthesis

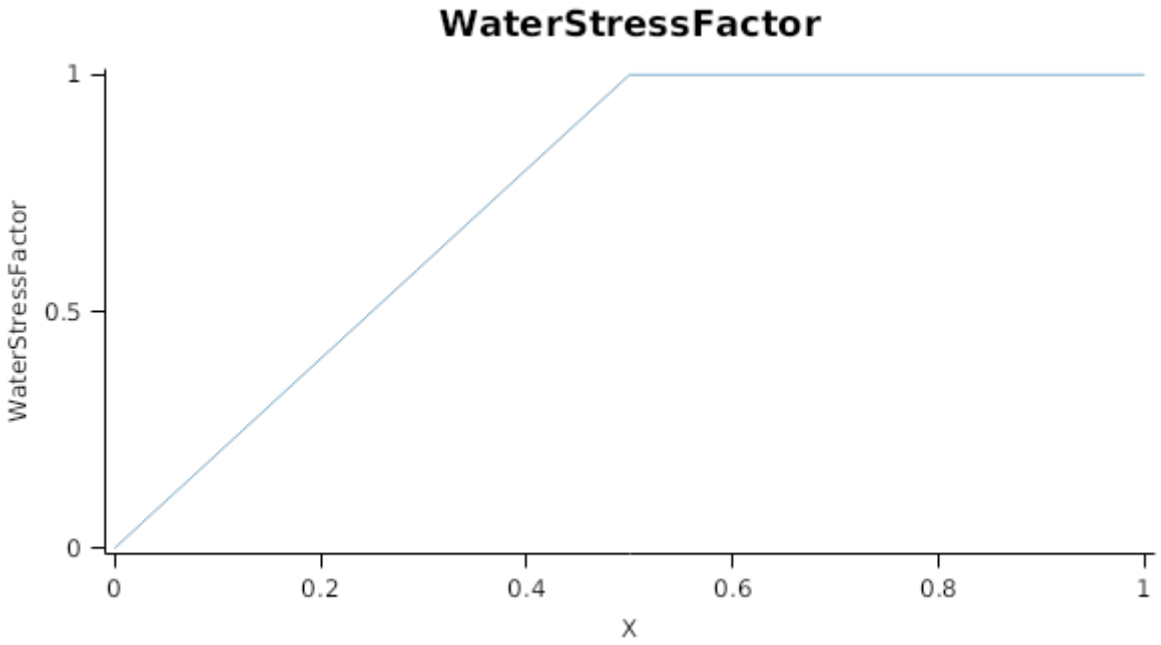
Photosynthesis = *UnStressedBiomass* x *WaterStressFactor*

UnStressedBiomass is the daily differential of

WaterStressFactor is calculated using linear interpolation

X	WaterStressFactor
0.0	0.0

X	WaterStressFactor
0.0	0.0
0.5	1.0
1.0	1.0



1.5.7 Nitrogen Supply

NReallocationFactor = 0

NRetranslocationFactor = 0

1.5.8 Canopy Properties

Stover has been defined with a CoverFunction. LAI is calculated using an inverted Beer-Lambert equation

Cover is calculated using specific values or functions for various growth phases. The function will use a value of zero for phases not specified below.

Expanding has a value between Emergence and StartSenescence calculated as:

SigCoverFunction is calcualted using a sigmoid function of the form y = Ymax * 1 / 1 + $e^{-(Xvalue - Xo) / b}$.

Ymax is calculated as:

Ymax = 0.97

Xo is calculated as:

Xo = 540

b is calculated as:

b = 120

XValue is calculated as:

XValue = [Phenology].AccumulatedEmergedTT

Senescence has a value between StartSenescence and Maturity calculated as:

DecreasingCover = *MaxCover* x *ProportionLost*

MaxCover = *ValueToHold* until StartSenescence after which the value is fixed.

ValueToHold = *[Stover].CoverGreen*

ProportionLost = 1 - *ProportionRemaining*

ProportionRemaining = *TTSenesce* / [Phenology].Senescing.Target

TTSenesce = [Phenology].AccumulatedEmergedTT - *ThermalTimeAtStartSenescence*

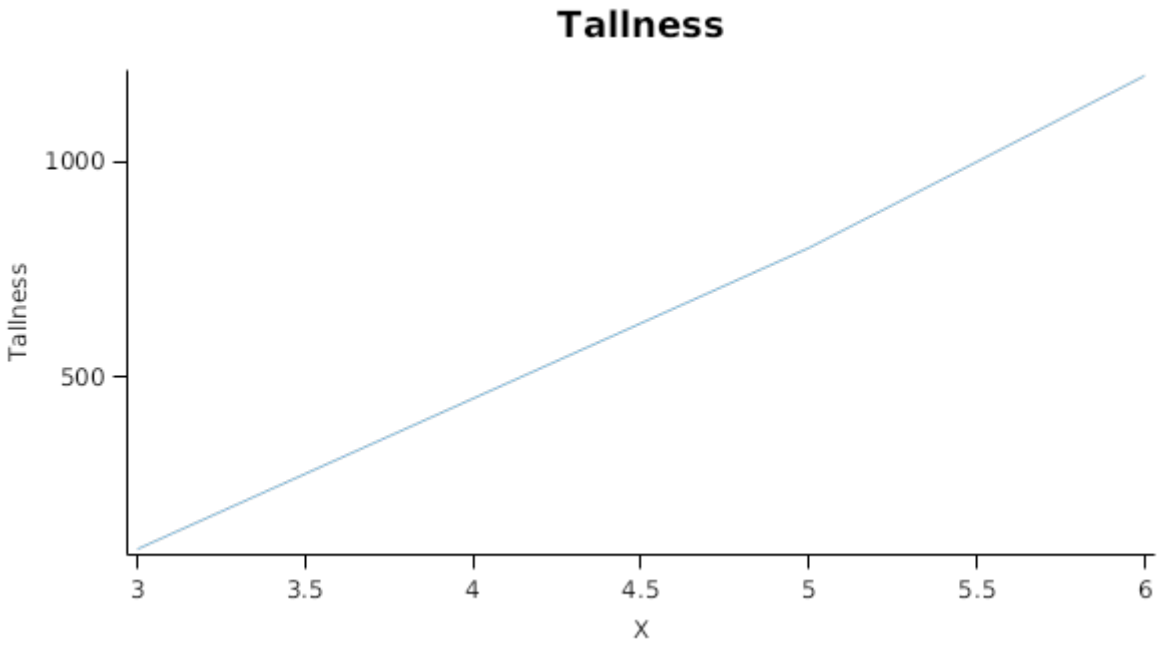
ThermalTimeAtStartSenescence = [Phenology].CanopyExpanding.Target + [Phenology].YieldIncreasing.Target

The extinction coefficient is used to calculate a LAI value (needed by MicroClimate) from the canopy cover

ExtinctionCoefficient = 0.5

Tallness is calculated using linear interpolation

X	Tallness
3.0	100.0
5.0	800.0
6.0	1200.0



1.5.9 StomatalConductance

Stomatal Conductance (gs) is calculated for use within the micromet model by adjusting a value provided for an atmospheric CO2 concentration of 350 ppm. The impact of other stresses (e.g. Temperature, N) are captured through the modifier, Frgr.

gs = Gsmax350 x FRGR x stomatalConductanceCO2Modifier

StomatalConductanceCO2Modifier = 1

1.5.10 Senescence and Detachment

Stover has senescence parameterised to zero so all biomass in this organ will remain alive.

Stover has detachment parameterised to zero so all biomass in this organ will remain with the plant until a defoliation or harvest event occurs.

1.5.11 Biomass removal

This organ will respond to certain management actions by either removing some of its biomass from the system or transferring some of its biomass to the soil surface residues. The following table describes the default proportions of live and dead biomass that are transferred out of the simulation using "Removed" or to soil surface residue using "To Residue" for a range of management actions. The total percentage removed for live or dead must not exceed 100%. The

difference between the total and 100% gives the biomass remaining on the plant. These can be changed during a simulation using a manager script.

Method	% Live Removed	% Dead Removed	% Live To Residue	% Dead To Residue
Harvest	0	0	30	0
Cut	80	0	0	0
Prune	0	0	60	0
Graze	60	0	10	0

1.6 Root

The root model calculates root growth in terms of rooting depth, biomass accumulation and subsequent root length density in each soil layer.

1.6.1 Growth

Roots grow downwards through the soil profile, with initial depth determined by sowing depth and the growth rate determined by RootFrontVelocity. The RootFrontVelocity is modified by multiplying it by the soil's XF value, which represents any resistance posed by the soil to root extension.

Root Depth Increase = RootFrontVelocity x XF_i *x RootDepthStressFactor*

where i is the index of the soil layer at the rooting front.

Root depth is also constrained by a maximum root depth.

Root length growth is calculated using the daily DM partitioned to roots and a specific root length. Root proliferation in layers is calculated using an approach similar to the generalised equimarginal criterion used in economics. The uptake of water and N per unit root length is used to partition new root material into layers of higher 'return on investment'. For example, the Root Activity for water is calculated as

RAw_i = *-WaterUptake*$_i$ */ LiveRootWt*$_i$ *x LayerThickness*$_i$ *x ProportionThroughLayer*

The amount of root mass partitioned to a layer is then proportional to root activity

$DMAllocated_i$ = *TotalDMAllocated x* RAw_i */ TotalRAw*

1.6.2 Dry Matter Demands

A daily DM demand is provided to the organ arbitrator and a DM supply returned. By default, 100% of the dry matter (DM) demanded from the root is structural. The daily loss of roots is calculated using a SenescenceRate function. All senesced material is automatically detached and added to the soil FOM.

1.6.3 Nitrogen Demands

The daily structural N demand from root is the product of total DM demand and the minimum N concentration. Any N above this is considered Storage and can be used for retranslocation and/or reallocation as the respective factors are set to values other then zero.

1.6.4 Nitrogen Uptake

Potential N uptake by the root system is calculated for each soil layer (i) that the roots have extended into. In each layer potential uptake is calculated as the product of the mineral nitrogen in the layer, a factor controlling the rate of extraction (kNO3 or kNH4), the concentration of N form (ppm), and a soil moisture factor (NUptakeSWFactor) which typically decreases as the soil dries. *NO3 uptake = NO3*$_i$ *x kNO3 x* $NO3_{ppm,\ i}$ *x NUptakeSWFactor* _NH4 uptake = $NH4_i$ x kNH4 x $NH4_{ppm,\ i}$ x NUptakeSWFactor_As can be seen from the above equations, the values of kNO3 and kNH4 equate to the potential fraction of each mineral N pool which can be taken up per day for wet soil when that pool has a concentration of 1 ppm.Nitrogen uptake demand is limited to the maximum daily potential uptake (MaxDailyNUptake) and the plant's N demand. The former provides a means to constrain N uptake to a maximum value observed in the field for the crop as a whole.The demand for soil N is then passed to the soil arbitrator which determines how much of the N uptake demandeach plant instance will be allowed to take up.

1.6.5 Water Uptake

Potential water uptake by the root system is calculated for each soil layer that the roots have extended into. In each layer potential uptake is calculated as the product of the available water in the layer (water above LL limit) and a factor

controlling the rate of extraction (KL). The values of both LL and KL are set in the soil interface and KL may be further modified by the crop via the KLModifier function. *SW uptake = $(SW_i - LL_i) \times KL_i \times KLModifier$*

1.6.6 Constants

DMConversionEfficiency = 1 (0-1)

RemobilisationCost = 0

SoilWaterEffect = 1

MaxDailyNUptake = 12

SenescenceRate = 0

MaximumNConc = 0.009

MinimumNConc = 0.009

MaximumRootDepth = 1500

This is the proportion of total biomass that is paritioned into the roots and is used to set the partitioning fraction for the roots

RootProportion = 0.1

SpecificRootLength = 40 (m/g)

MaintenanceRespirationFunction = 0

CarbonConcentration = 0.4

RootDepthStressFactor = 1

1.6.7 RootShape

This model calculates the proportion of each soil layer occupided by roots.

1.6.8 Description

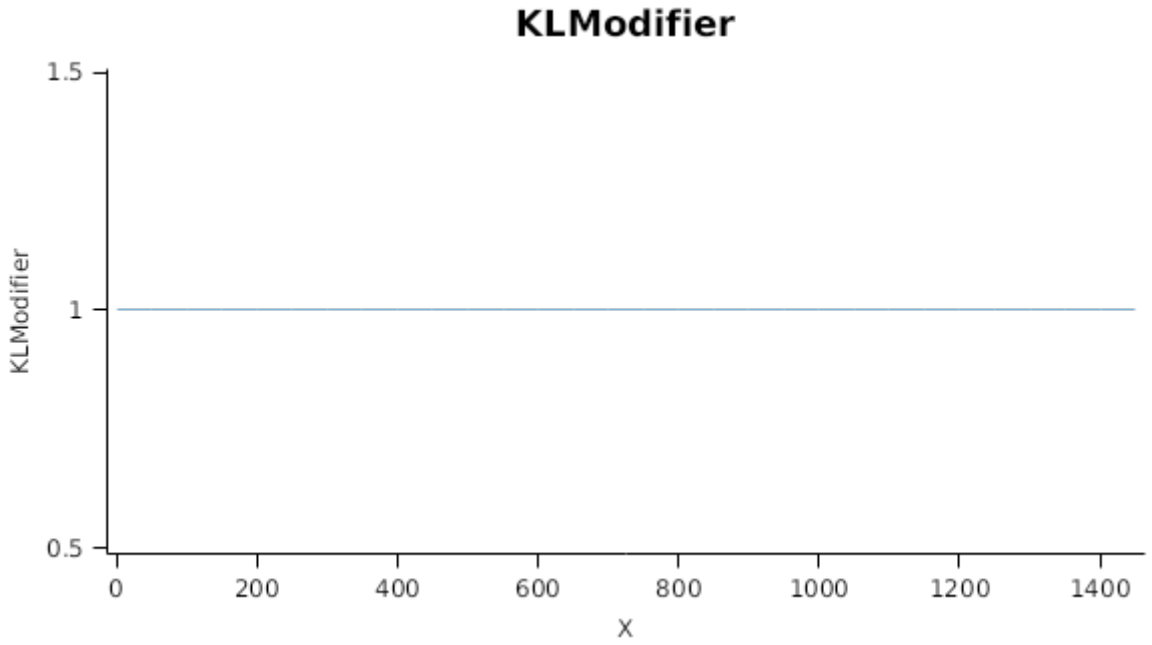
The root organ demands and is partitioned N and DM and its depth increases through time to provide a water uptake supply

1.6.9 KLModifier

KLModifier is calculated using linear interpolation

X	KLModifier
0.0	1.0
50.0	1.0
100.0	1.0
150.0	1.0
200.0	1.0
250.0	1.0
300.0	1.0
350.0	1.0
400.0	1.0
450.0	1.0
500.0	1.0

X	KLModifier
550.0	1.0
600.0	1.0
650.0	1.0
700.0	1.0
750.0	1.0
800.0	1.0
850.0	1.0
900.0	1.0
950.0	1.0
1000.0	1.0
1050.0	1.0
1100.0	1.0
1150.0	1.0
1200.0	1.0
1250.0	1.0
1300.0	1.0
1350.0	1.0
1400.0	1.0
1450.0	1.0



1.6.10 NitrogenDemandSwitch

NitrogenDemandSwitch has a value between Germination and Maturity calculated as:

Constant = 1

1.6.11 RootFrontVelocity

RootFrontVelocity = *RootFrontVelocity* x [Phenology].ThermalTime

IF [Phenology].AccumulatedEmergedTT < GrowthDuration THEN

IfTrue = [Root].MaximumRootDepth / [Root].RootFrontVelocity.RootFrontVelocity.GrowthDuration

ELSE

IfFalse = 0

1.6.12 BiomassRemovalDefaults

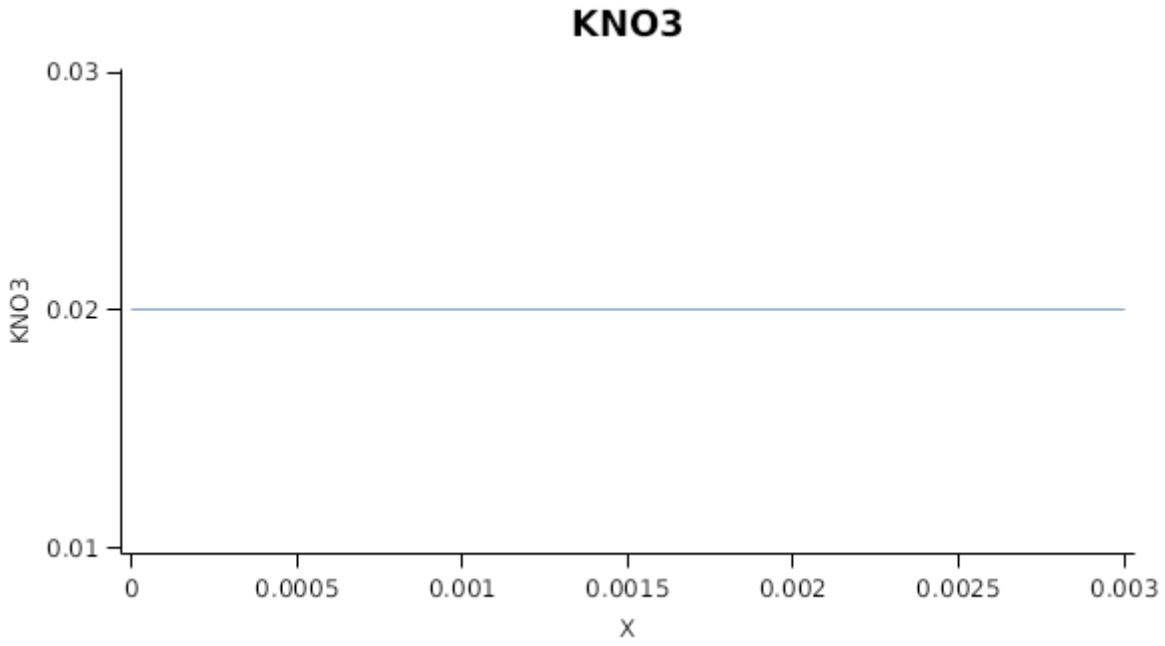
This organ will respond to certain management actions by either removing some of its biomass from the system or transferring some of its biomass to the soil surface residues. The following table describes the default proportions of live and dead biomass that are transferred out of the simulation using "Removed" or to soil surface residue using "To Residue" for a range of management actions. The total percentage removed for live or dead must not exceed 100%. The difference between the total and 100% gives the biomass remaining on the plant. These can be changed during a simulation using a manager script.

Method	% Live Removed	% Dead Removed	% Live To Residue	% Dead To Residue
Harvest	0	0	20	0
Cut	0	0	30	0
Prune	0	0	10	0
Graze	0	0	15	0

1.6.13 KNO3

KNO3 is calculated using linear interpolation

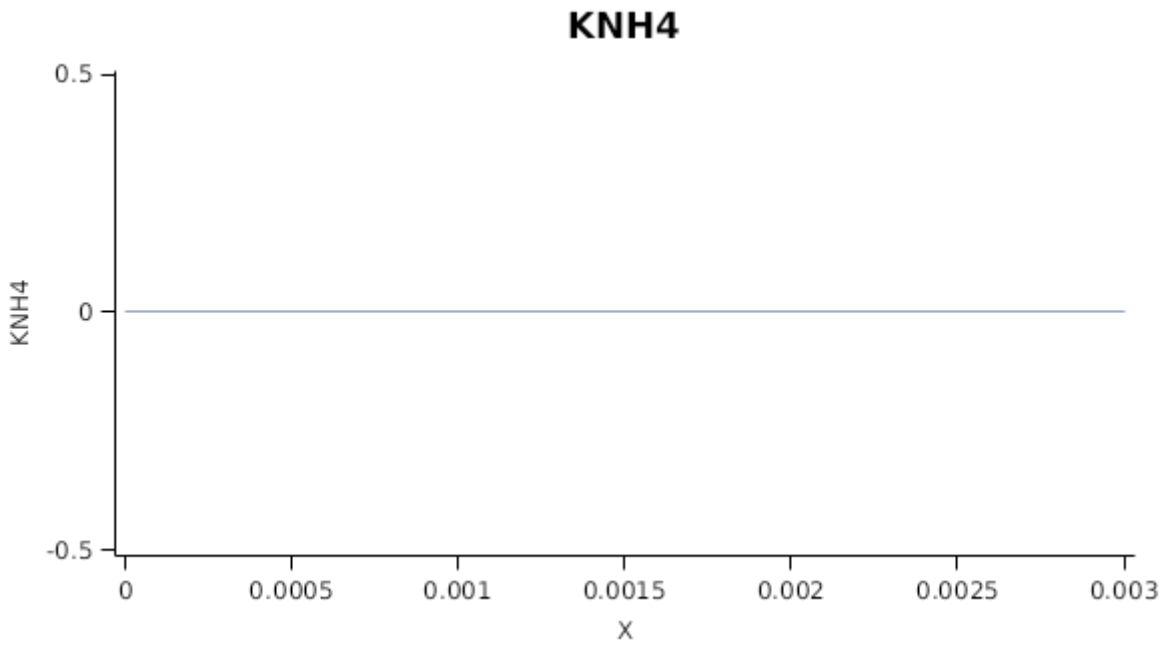
X	KNO3
0.0	0.0
0.0	0.0



1.6.14 KNH4

KNH4 is calculated using linear interpolation

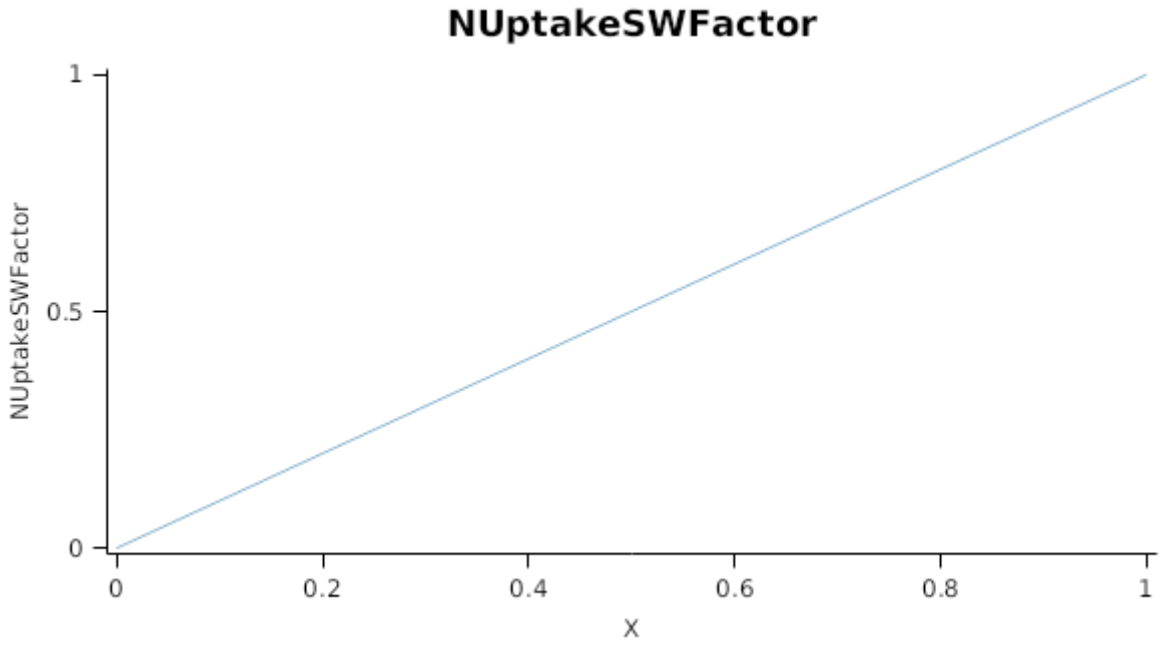
X	KNH4
0.0	0.0
0.0	0.0



1.6.15 NUptakeSWFactor

NUptakeSWFactor is calculated using linear interpolation

X	NUptakeSWFactor
0.0	0.0
1.0	1.0



1.6.16 DMDemands

1.6.16.1 DMDemands

This class holds the functions for calculating the absolute demands and priorities for each biomass fraction.

Structural = *DMDemandFunction* x *StructuralFraction*

Returns the product of its PartitionFraction and the total DM supplied to the arbitrator by all organs.

DMDemandFunction = PartitionFraction x [Arbitrator].DM.TotalFixationSupply

PartitionFraction has a value between Emergence and EndReproductive calculated as:

RootProportion = [Root].RootProportion

StructuralFraction = 1

Metabolic = 0

The partitioning of daily growth to storage biomass is based on a storage fraction.

StorageFraction = 1 - [Root].DMDemands.Structural.StructuralFraction

QStructuralPriority = 1

QMetabolicPriority = 1

QStoragePriority = 1

1.6.17 NDemands

1.6.17.1 NDemands

This class holds the functions for calculating the absolute demands and priorities for each biomass fraction.

Structural = [Root].minimumNconc x [Root].potentialDMAllocation.Structural

Metabolic = *MetabolicNconc* x [Root].potentialDMAllocation.Structural

MetabolicNconc = [Root].criticalNConc - [Root].minimumNconc

The partitioning of daily N supply to storage N attempts to bring the organ's N content to the maximum concentration.

Storage = [Root].maximumNconc × ([Root].Live.Wt + potentialAllocationWt) - [Root].Live.N

The demand for storage N is further reduced by a factor specified by the [Root].NitrogenDemandSwitch.

NitrogenDemandSwitch = [Root].nitrogenDemandSwitch

MaxNconc = [Root].maximumNconc

QStructuralPriority = 1

QMetabolicPriority = 1

QStoragePriority = 1

1.6.18 CriticalNConc

CriticalNConc = [Root].MinimumNConc

1.6.19 InitialWt

This class holds the functions for calculating the absolute demands for each biomass fraction.

Structural = 0.2 (g/plant)

Metabolic = 0

Storage = 0

1.7 Nodule

This organ simulates the root structure associate with symbiotic N-fixing bacteria. It provides the core functions of determining N fixation supply and related costs. It also calculates the growth, senescence and detachment of nodules.

1.7.1 Dry Matter Demand

The dry matter demand for the organ is calculated as defined in DMDemands, based on the DMDemandFunction and partition fractions for each biomass pool.

This class holds the functions for calculating the absolute demands for each biomass fraction.

Structural = *DMDemandFunction* x *StructuralFraction*

DMDemandFunction = 0 (g/m^2)

StructuralFraction = 1 (0-1)

Metabolic = 0

The partitioning of daily growth to storage biomass is based on a storage fraction.

StorageFraction = 1 - [Nodule].DMDemands.Structural.StructuralFraction

1.7.2 Nitrogen Demand

The N demand is calculated as defined in NDemands, based on DM demand the N concentration of each biomass pool.

This class holds the functions for calculating the absolute demands for each biomass fraction.

Structural = [Nodule].minimumNconc x [Nodule].potentialDMAllocation.Structural

Metabolic = *MetabolicNconc* x [Nodule].potentialDMAllocation.Structural

MetabolicNconc = [Nodule].criticalNConc - [Nodule].minimumNconc

The partitioning of daily N supply to storage N attempts to bring the organ's N content to the maximum concentration.

Storage = [Nodule].maximumNconc × ([Nodule].Live.Wt + potentialAllocationWt) - [Nodule].Live.N

The demand for storage N is further reduced by a factor specified by the [Nodule].NitrogenDemandSwitch.

NitrogenDemandSwitch = [Nodule].nitrogenDemandSwitch

MaxNconc = [Nodule].maximumNconc

MinimumNConc = 0

CriticalNConc = [Nodule].MinimumNConc

MaximumNConc = 0

1.7.3 Dry Matter Supply

Nodule does not reallocate DM when senescence of the organ occurs.

Nodule does not retranslocate non-structural DM.

1.7.4 Nitrogen Supply

Nodule does not reallocate N when senescence of the organ occurs.

Nodule does not retranslocate non-structural N.

FixationRate = 0

1.7.5 Senescence and Detachment

Nodule has senescence parameterised to zero so all biomass in this organ will remain alive.

Nodule has detachment parameterised to zero so all biomass in this organ will remain with the plant until a defoliation or harvest event occurs.

This organ will respond to certain management actions by either removing some of its biomass from the system or transferring some of its biomass to the soil surface residues. The following table describes the default proportions of live and dead biomass that are transferred out of the simulation using "Removed" or to soil surface residue using "To Residue" for a range of management actions. The total percentage removed for live or dead must not exceed 100%. The difference between the total and 100% gives the biomass remaining on the plant. These can be changed during a simulation using a manager script.

Method	% Live Removed	% Dead Removed	% Live To Residue	% Dead To Residue
Harvest	0	0	0	0
Cut	0	0	0	0
Prune	0	0	0	0
Graze	0	0	0	0

1.8 Total

1.8.1 Total

This is a composite biomass class, representing the sum of 1 or more biomass objects from one or more organs.

Total summarises the following biomass objects:

* Stover
* Product
* Root

1.9 AboveGround

1.9.1 AboveGround

This is a composite biomass class, representing the sum of 1 or more biomass objects from one or more organs.

AboveGround summarises the following biomass objects:

* Stover
* Product

1.10 Barley_Autumn

Barley_Autumn overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1461.0

[Phenology].Senescing.Target.FixedValue = 600

[Phenology].YieldIncreasing.Target.FixedValue = 939.0

[Product].DryMatterContent.FixedValue = 0.87

[Product].ExpectedYield.FixedValue = 1200

[Product].HarvestIndex.FixedValue = 0.51

[Product].MaximumNConc.FixedValue = 0.02

[Product].MinimumNConc.FixedValue = 0.01

[Root].KLModifier.XYPairs.Y =
1,1,1,1,1,1,1,0.882,0.779,0.687,0.607,0.535,0.472,0.417,0.368,0.325,0.287,0.253,0.223,0.197,0.174,0.153,0.135,0.119,0.105,0.

[Root].MaximumNConc.FixedValue = 0.009

[Root].MaximumRootDepth.FixedValue = 1500

[Root].MinimumNConc.FixedValue = 0.009

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 540

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.006

[Stover].MinimumNConc.FixedValue = 0.006

[Stover].XoBiomass.FixedValue = 1500.0

[Stover].bBiomass.FixedValue = 300.0

1.11 Barley_Spring

Barley_Spring overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 848.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 652.0

[Product].DryMatterContent.FixedValue = 0.87

[Product].ExpectedYield.FixedValue = 800

[Product].HarvestIndex.FixedValue = 0.46

[Product].MaximumNConc.FixedValue = 0.02

[Product].MinimumNConc.FixedValue = 0.01

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.807,0.651,0.526,0.424,0.343,0.276,0.223,0.18,0.145,0.117,0.095,0.076,0.062,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.009

[Root].MaximumRootDepth.FixedValue = 1000

[Root].MinimumNConc.FixedValue = 0.009

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 540

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.006

[Stover].MinimumNConc.FixedValue = 0.006

[Stover].XoBiomass.FixedValue = 900.0

[Stover].bBiomass.FixedValue = 180.0

1.12 Barley_SpringForage

Barley_SpringForage overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 326.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 1174.0

[Product].DryMatterContent.FixedValue = 0.4

[Product].ExpectedYield.FixedValue = 2000

[Product].HarvestIndex.FixedValue = 0.95

[Product].MaximumNConc.FixedValue = 0.013

[Product].MinimumNConc.FixedValue = 0.0091

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.882,0.779,0.687,0.607,0.535,0.472,0.417,0.368,0.325,0.287,0.253,0.223,0.197,0.174,0.153,0.135,0.119,0.105,0.

[Root].MaximumNConc.FixedValue = 0.009

[Root].MaximumRootDepth.FixedValue = 1500

[Root].MinimumNConc.FixedValue = 0.009

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 540

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.005

[Stover].MinimumNConc.FixedValue = 0.005

[Stover].XoBiomass.FixedValue = 900.0

[Stover].bBiomass.FixedValue = 180.0

1.13 Beets

Beets overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 874.0

[Phenology].Senescing.Target.FixedValue = 750

[Phenology].YieldIncreasing.Target.FixedValue = 1076.0

[Product].DryMatterContent.FixedValue = 0.14

[Product].ExpectedYield.FixedValue = 5500

[Product].HarvestIndex.FixedValue = 0.815

[Product].MaximumNConc.FixedValue = 0.015

[Product].MinimumNConc.FixedValue = 0.0105

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.472,0.223,0.105,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.01

[Root].MaximumRootDepth.FixedValue = 500

[Root].MinimumNConc.FixedValue = 0.01

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 690

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.95

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.02

[Stover].MinimumNConc.FixedValue = 0.02

[Stover].XoBiomass.FixedValue = 1350.0

[Stover].bBiomass.FixedValue = 270.0

1.14 Beets_Seed

Beets_Seed overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1534.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 1107.0

[Product].DryMatterContent.FixedValue = 0.85

[Product].ExpectedYield.FixedValue = 200

[Product].HarvestIndex.FixedValue = 0.2

[Product].MaximumNConc.FixedValue = 0.03

[Product].MinimumNConc.FixedValue = 0.0105

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.807,0.651,0.526,0.424,0.343,0.276,0.223,0.18,0.145,0.117,0.095,0.076,0.062,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.008

[Root].MaximumRootDepth.FixedValue = 1000

[Root].MinimumNConc.FixedValue = 0.01

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 540

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.02

[Stover].MinimumNConc.FixedValue = 0.02

[Stover].XoBiomass.FixedValue = 1470.0

[Stover].bBiomass.FixedValue = 294.0

1.15 Brassica

Brassica overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 420.0

[Phenology].Senescing.Target.FixedValue = 0

[Phenology].YieldIncreasing.Target.FixedValue = 1230.0

[Product].DryMatterContent.FixedValue = 1.0

[Product].ExpectedYield.FixedValue = 800

[Product].HarvestIndex.FixedValue = 0.9

[Product].MaximumNConc.FixedValue = 0.03

[Product].MinimumNConc.FixedValue = 0.021

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.687,0.472,0.325,0.223,0.153,0.105,0.072,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.01

[Root].MaximumRootDepth.FixedValue = 700

[Root].MinimumNConc.FixedValue = 0.01

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 690

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 60

[Stover].MaximumNConc.FixedValue = 0.03

[Stover].MinimumNConc.FixedValue = 0.03

[Stover].XoBiomass.FixedValue = 825.0

[Stover].bBiomass.FixedValue = 165.0

1.16 Broccoli_Seed

Broccoli_Seed overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1192.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 523.0

[Product].DryMatterContent.FixedValue = 0.84

[Product].ExpectedYield.FixedValue = 150

[Product].HarvestIndex.FixedValue = 0.2

[Product].MaximumNConc.FixedValue = 0.03

[Product].MinimumNConc.FixedValue = 0.02

[Root].KLModifier.XYPairs.Y =
1,1,1,1,1,1,1,0.807,0.651,0.526,0.424,0.343,0.276,0.223,0.18,0.145,0.117,0.095,0.076,0.062,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.008

[Root].MaximumRootDepth.FixedValue = 1000

[Root].MinimumNConc.FixedValue = 0.008

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 540

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.02

[Stover].MinimumNConc.FixedValue = 0.02

[Stover].XoBiomass.FixedValue = 1008.0

[Stover].bBiomass.FixedValue = 202.0

1.17 Broccoli_summer

Broccoli_summer overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1664.0

[Phenology].Senescing.Target.FixedValue = 900

[Phenology].YieldIncreasing.Target.FixedValue = 436.0

[Product].DryMatterContent.FixedValue = 0.11

[Product].ExpectedYield.FixedValue = 1200

[Product].HarvestIndex.FixedValue = 0.2

[Product].MaximumNConc.FixedValue = 0.035

[Product].MinimumNConc.FixedValue = 0.0245

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.472,0.223,0.105,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.009

[Root].MaximumRootDepth.FixedValue = 500

[Root].MinimumNConc.FixedValue = 0.009

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 450

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.8

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.038

[Stover].MinimumNConc.FixedValue = 0.038

[Stover].XoBiomass.FixedValue = 1500.0

[Stover].bBiomass.FixedValue = 300.0

1.18 Broccoli_winter_spring

Broccoli_winter_spring overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1739.0

[Phenology].Senescing.Target.FixedValue = 900

[Phenology].YieldIncreasing.Target.FixedValue = 361.0

[Product].DryMatterContent.FixedValue = 0.11

[Product].ExpectedYield.FixedValue = 800

[Product].HarvestIndex.FixedValue = 0.13

[Product].MaximumNConc.FixedValue = 0.035

[Product].MinimumNConc.FixedValue = 0.0245

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.472,0.223,0.105,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.009

[Root].MaximumRootDepth.FixedValue = 500

[Root].MinimumNConc.FixedValue = 0.009

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 450

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.8

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.038

[Stover].MinimumNConc.FixedValue = 0.038

[Stover].XoBiomass.FixedValue = 1500.0

[Stover].bBiomass.FixedValue = 300.0

1.19 BrusselSprouts

BrusselSprouts overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1470.0

[Phenology].Senescing.Target.FixedValue = 900

[Phenology].YieldIncreasing.Target.FixedValue = 630.0

[Product].DryMatterContent.FixedValue = 0.2

[Product].ExpectedYield.FixedValue = 1500

[Product].HarvestIndex.FixedValue = 0.4

[Product].MaximumNConc.FixedValue = 0.035

[Product].MinimumNConc.FixedValue = 0.0245

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.472,0.223,0.105,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.009

[Root].MaximumRootDepth.FixedValue = 500

[Root].MinimumNConc.FixedValue = 0.009

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 450

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.8

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.038

[Stover].MinimumNConc.FixedValue = 0.038

[Stover].XoBiomass.FixedValue = 1500.0

[Stover].bBiomass.FixedValue = 300.0

1.20 Cabbage_summer

Cabbage_summer overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1080.0

[Phenology].Senescing.Target.FixedValue = 900

[Phenology].YieldIncreasing.Target.FixedValue = 1020.0

[Product].DryMatterContent.FixedValue = 0.08

[Product].ExpectedYield.FixedValue = 7000

[Product].HarvestIndex.FixedValue = 0.75

[Product].MaximumNConc.FixedValue = 0.026

[Product].MinimumNConc.FixedValue = 0.0182

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.472,0.223,0.105,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.009

[Root].MaximumRootDepth.FixedValue = 500

[Root].MinimumNConc.FixedValue = 0.009

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 360

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.8

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.03

[Stover].MinimumNConc.FixedValue = 0.03

[Stover].XoBiomass.FixedValue = 1500.0

[Stover].bBiomass.FixedValue = 300.0

1.21 Cabbage_winter_spring

Cabbage_winter_spring overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1269.0

[Phenology].Senescing.Target.FixedValue = 900

[Phenology].YieldIncreasing.Target.FixedValue = 831.0

[Product].DryMatterContent.FixedValue = 0.12

[Product].ExpectedYield.FixedValue = 5000

[Product].HarvestIndex.FixedValue = 0.6

[Product].MaximumNConc.FixedValue = 0.026

[Product].MinimumNConc.FixedValue = 0.0182

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.472,0.223,0.105,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.009

[Root].MaximumRootDepth.FixedValue = 500

[Root].MinimumNConc.FixedValue = 0.009

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 360

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.8

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.03

[Stover].MinimumNConc.FixedValue = 0.03

[Stover].XoBiomass.FixedValue = 1500.0

[Stover].bBiomass.FixedValue = 300.0

1.22 Carrots

Carrots overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 955.0

[Phenology].Senescing.Target.FixedValue = 750

[Phenology].YieldIncreasing.Target.FixedValue = 2045.0

[Product].DryMatterContent.FixedValue = 0.12

[Product].ExpectedYield.FixedValue = 7000

[Product].HarvestIndex.FixedValue = 0.9

[Product].MaximumNConc.FixedValue = 0.01

[Product].MinimumNConc.FixedValue = 0.007

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.472,0.223,0.105,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.01

[Root].MaximumRootDepth.FixedValue = 500

[Root].MinimumNConc.FixedValue = 0.01

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 690

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.9

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.02

[Stover].MinimumNConc.FixedValue = 0.02

[Stover].XoBiomass.FixedValue = 1875.0

[Stover].bBiomass.FixedValue = 375.0

1.23 Carrot_Seed

Carrot_Seed overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 2423.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 1511.0

[Product].DryMatterContent.FixedValue = 0.85

[Product].ExpectedYield.FixedValue = 170

[Product].HarvestIndex.FixedValue = 0.15

[Product].MaximumNConc.FixedValue = 0.03

[Product].MinimumNConc.FixedValue = 0.01

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.472,0.223,0.105,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.008

[Root].MaximumRootDepth.FixedValue = 1000

[Root].MinimumNConc.FixedValue = 0.008

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 690

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.95

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.02

[Stover].MinimumNConc.FixedValue = 0.02

[Stover].XoBiomass.FixedValue = 2117.0

[Stover].bBiomass.FixedValue = 423.0

1.24 Cauliflower_summer

Cauliflower_summer overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1422.0

[Phenology].Senescing.Target.FixedValue = 900

[Phenology].YieldIncreasing.Target.FixedValue = 678.0

[Product].DryMatterContent.FixedValue = 0.09

[Product].ExpectedYield.FixedValue = 5000

[Product].HarvestIndex.FixedValue = 0.45

[Product].MaximumNConc.FixedValue = 0.035

[Product].MinimumNConc.FixedValue = 0.0245

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.472,0.223,0.105,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.009

[Root].MaximumRootDepth.FixedValue = 500

[Root].MinimumNConc.FixedValue = 0.009

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 450

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.8

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.038

[Stover].MinimumNConc.FixedValue = 0.038

[Stover].XoBiomass.FixedValue = 1500.0

[Stover].bBiomass.FixedValue = 300.0

1.25 Cauliflower_winter_spring

Cauliflower_winter_spring overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1566.0

[Phenology].Senescing.Target.FixedValue = 900

[Phenology].YieldIncreasing.Target.FixedValue = 534.0

[Product].DryMatterContent.FixedValue = 0.1

[Product].ExpectedYield.FixedValue = 3000

[Product].HarvestIndex.FixedValue = 0.3

[Product].MaximumNConc.FixedValue = 0.035

[Product].MinimumNConc.FixedValue = 0.0245

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.472,0.223,0.105,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.009

[Root].MaximumRootDepth.FixedValue = 500

[Root].MinimumNConc.FixedValue = 0.009

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 450

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.8

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.038

[Stover].MinimumNConc.FixedValue = 0.038

[Stover].XoBiomass.FixedValue = 1500.0

[Stover].bBiomass.FixedValue = 300.0

1.26 Chicory_Seed

Chicory_Seed overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 2587.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 1347.0

[Product].DryMatterContent.FixedValue = 0.85

[Product].ExpectedYield.FixedValue = 150

[Product].HarvestIndex.FixedValue = 0.05

[Product].MaximumNConc.FixedValue = 0.03

[Product].MinimumNConc.FixedValue = 0.0105

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.807,0.651,0.526,0.424,0.343,0.276,0.223,0.18,0.145,0.117,0.095,0.076,0.062,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.01

[Root].MaximumRootDepth.FixedValue = 1000

[Root].MinimumNConc.FixedValue = 0.01

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 690

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.95

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.015

[Stover].MinimumNConc.FixedValue = 0.01

[Stover].XoBiomass.FixedValue = 2117.0

[Stover].bBiomass.FixedValue = 423.7

1.27 Clover_1styear

Clover_1styear overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 1000

[Phenology].CanopyExpanding.Target.FixedValue = 2141.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 1159.0

[Product].DryMatterContent.FixedValue = 0.85

[Product].ExpectedYield.FixedValue = 60

[Product].HarvestIndex.FixedValue = 0.09

[Product].MaximumNConc.FixedValue = 0.035

[Product].MinimumNConc.FixedValue = 0.0245

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.779,0.607,0.472,0.368,0.287,0.223,0.174,0.135,0.105,0.082,0.064,0,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.01

[Root].MaximumRootDepth.FixedValue = 900

[Root].MinimumNConc.FixedValue = 0.01

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 750

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.8

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.04

[Stover].MinimumNConc.FixedValue = 0.04

[Stover].XoBiomass.FixedValue = 1800.0

[Stover].bBiomass.FixedValue = 360.0

1.28 Clover_2ndyear

Clover_2ndyear overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 1000

[Phenology].CanopyExpanding.Target.FixedValue = 1249.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 551.0

[Product].DryMatterContent.FixedValue = 0.85

[Product].ExpectedYield.FixedValue = 60

[Product].HarvestIndex.FixedValue = 0.09

[Product].MaximumNConc.FixedValue = 0.037

[Product].MinimumNConc.FixedValue = 0.0245

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.779,0.607,0.472,0.368,0.287,0.223,0.174,0.135,0.105,0.082,0.064,0,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.01

[Root].MaximumRootDepth.FixedValue = 900

[Root].MinimumNConc.FixedValue = 0.01

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 300

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.04

[Stover].MinimumNConc.FixedValue = 0.04

[Stover].XoBiomass.FixedValue = 1050.0

[Stover].bBiomass.FixedValue = 210.0

1.29 Corn_Salad

Corn_Salad overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1461.0

[Phenology].Senescing.Target.FixedValue = 600

[Phenology].YieldIncreasing.Target.FixedValue = 939.0

[Product].DryMatterContent.FixedValue = 0.87

[Product].ExpectedYield.FixedValue = 100

[Product].HarvestIndex.FixedValue = 0.1

[Product].MaximumNConc.FixedValue = 0.0205

[Product].MinimumNConc.FixedValue = 0.01

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.779,0.607,0.472,0.368,0.287,0.223,0.174,0.135,0.105,0.082,0.064,0,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.01

[Root].MaximumRootDepth.FixedValue = 900

[Root].MinimumNConc.FixedValue = 0.01

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 540

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.0069

[Stover].MinimumNConc.FixedValue = 0.0069

[Stover].XoBiomass.FixedValue = 1500.0

[Stover].bBiomass.FixedValue = 300.0

1.30 Dried_Beans

Dried_Beans overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 1000

[Phenology].CanopyExpanding.Target.FixedValue = 755.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 595.0

[Product].DryMatterContent.FixedValue = 0.86

[Product].ExpectedYield.FixedValue = 350

[Product].HarvestIndex.FixedValue = 0.5

[Product].MaximumNConc.FixedValue = 0.035

[Product].MinimumNConc.FixedValue = 0.0245

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.687,0.472,0.325,0.223,0.153,0.105,0.072,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.015

[Root].MaximumRootDepth.FixedValue = 700

[Root].MinimumNConc.FixedValue = 0.015

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 690

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 60

[Stover].MaximumNConc.FixedValue = 0.02

[Stover].MinimumNConc.FixedValue = 0.02

[Stover].XoBiomass.FixedValue = 825.0

[Stover].bBiomass.FixedValue = 165.0

1.31 Dried_Peas

Dried_Peas overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 1000

[Phenology].CanopyExpanding.Target.FixedValue = 755.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 595.0

[Product].DryMatterContent.FixedValue = 0.86

[Product].ExpectedYield.FixedValue = 350

[Product].HarvestIndex.FixedValue = 0.5

[Product].MaximumNConc.FixedValue = 0.035

[Product].MinimumNConc.FixedValue = 0.0245

[Root].KLModifier.XYPairs.Y =
1,1,1,1,1,1,1,0.846,0.717,0.607,0.513,0.435,0.368,0.311,0.264,0.223,0.189,0.16,0.135,0.115,0.097,0.082,0.069,0.059,0,0,0,0,0,

[Root].MaximumNConc.FixedValue = 0.015

[Root].MaximumRootDepth.FixedValue = 1200

[Root].MinimumNConc.FixedValue = 0.015

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 690

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 60

[Stover].MaximumNConc.FixedValue = 0.02

[Stover].MinimumNConc.FixedValue = 0.02

[Stover].XoBiomass.FixedValue = 825.0

[Stover].bBiomass.FixedValue = 165.0

1.32 Green_Beans

Green_Beans overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 1000

[Phenology].CanopyExpanding.Target.FixedValue = 782.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 568.0

[Product].DryMatterContent.FixedValue = 0.21

[Product].ExpectedYield.FixedValue = 800

[Product].HarvestIndex.FixedValue = 0.45

[Product].MaximumNConc.FixedValue = 0.035

[Product].MinimumNConc.FixedValue = 0.0245

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.687,0.472,0.325,0.223,0.153,0.105,0.072,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.015

[Root].MaximumRootDepth.FixedValue = 700

[Root].MinimumNConc.FixedValue = 0.015

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 690

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.8

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 60

[Stover].MaximumNConc.FixedValue = 0.03

[Stover].MinimumNConc.FixedValue = 0.03

[Stover].XoBiomass.FixedValue = 825.0

[Stover].bBiomass.FixedValue = 165.0

1.33 Green_Peas

Green_Peas overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 1000

[Phenology].CanopyExpanding.Target.FixedValue = 782.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 568.0

[Product].DryMatterContent.FixedValue = 0.21

[Product].ExpectedYield.FixedValue = 800

[Product].HarvestIndex.FixedValue = 0.45

[Product].MaximumNConc.FixedValue = 0.035

[Product].MinimumNConc.FixedValue = 0.0245

[Root].KLModifier.XYPairs.Y =
1,1,1,1,1,1,1,0.846,0.717,0.607,0.513,0.435,0.368,0.311,0.264,0.223,0.189,0.16,0.135,0.115,0.097,0.082,0.069,0.059,0,0,0,0,0,

[Root].MaximumNConc.FixedValue = 0.015

[Root].MaximumRootDepth.FixedValue = 1200

[Root].MinimumNConc.FixedValue = 0.015

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 690

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 60

[Stover].MaximumNConc.FixedValue = 0.03

[Stover].MinimumNConc.FixedValue = 0.03

[Stover].XoBiomass.FixedValue = 825.0

[Stover].bBiomass.FixedValue = 165.0

1.34 FodderBeet

FodderBeet overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1150.0

[Phenology].Senescing.Target.FixedValue = 0

[Phenology].YieldIncreasing.Target.FixedValue = 1850.0

[Product].DryMatterContent.FixedValue = 0.16

[Product].ExpectedYield.FixedValue = 12000

[Product].HarvestIndex.FixedValue = 0.7

[Product].MaximumNConc.FixedValue = 0.025

[Product].MinimumNConc.FixedValue = 0.15

[Root].KLModifier.XYPairs.Y =
1,1,1,1,1,1,1,0.946,0.895,0.846,0.801,0.757,0.717,0.678,0.641,0.607,0.574,0.543,0.513,0.486,0.459,0.435,0.411,0.389,0.368,0.

[Root].MaximumNConc.FixedValue = 0.008

[Root].MaximumRootDepth.FixedValue = 3000

[Root].MinimumNConc.FixedValue = 0.008

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 867

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 141

[Stover].MaximumNConc.FixedValue = 0.01

[Stover].MinimumNConc.FixedValue = 0.01

[Stover].XoBiomass.FixedValue = 1500.0

[Stover].bBiomass.FixedValue = 300.0

1.35 Italian_Ryegrass

Italian_Ryegrass overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1590.0

[Phenology].Senescing.Target.FixedValue = 450

[Phenology].YieldIncreasing.Target.FixedValue = 660.0

[Product].DryMatterContent.FixedValue = 0.85

[Product].ExpectedYield.FixedValue = 350

[Product].HarvestIndex.FixedValue = 0.15

[Product].MaximumNConc.FixedValue = 0.0205

[Product].MinimumNConc.FixedValue = 0.01

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.807,0.651,0.526,0.424,0.343,0.276,0.223,0.18,0.145,0.117,0.095,0.076,0.062,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.01

[Root].MaximumRootDepth.FixedValue = 1000

[Root].MinimumNConc.FixedValue = 0.01

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 540

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.0069

[Stover].MinimumNConc.FixedValue = 0.0069

[Stover].XoBiomass.FixedValue = 900.0

[Stover].bBiomass.FixedValue = 180.0

1.36 Kale

Kale overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1150.0

[Phenology].Senescing.Target.FixedValue = 0

[Phenology].YieldIncreasing.Target.FixedValue = 1850.0

[Product].DryMatterContent.FixedValue = 0.16

[Product].ExpectedYield.FixedValue = 7500

[Product].HarvestIndex.FixedValue = 0.7

[Product].MaximumNConc.FixedValue = 0.03

[Product].MinimumNConc.FixedValue = 0.02

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.946,0.895,0.846,0.801,0.757,0.717,0.678,0.641,0.607,0.574,0.543,0.513,0.486,0.459,0.435,0.411,0.389,0.368,0.

[Root].MaximumNConc.FixedValue = 0.008

[Root].MaximumRootDepth.FixedValue = 3000

[Root].MinimumNConc.FixedValue = 0.008

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 867

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 141

[Stover].MaximumNConc.FixedValue = 0.01

[Stover].MinimumNConc.FixedValue = 0.01

[Stover].XoBiomass.FixedValue = 1500.0

[Stover].bBiomass.FixedValue = 300.0

1.37 Kumara

Kumara overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 716.0

[Phenology].Senescing.Target.FixedValue = 750

[Phenology].YieldIncreasing.Target.FixedValue = 1234.0

[Product].DryMatterContent.FixedValue = 0.23

[Product].ExpectedYield.FixedValue = 5000

[Product].HarvestIndex.FixedValue = 0.89

[Product].MaximumNConc.FixedValue = 0.018

[Product].MinimumNConc.FixedValue = 0.0126

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.472,0.223,0.105,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.01

[Root].MaximumRootDepth.FixedValue = 500

[Root].MinimumNConc.FixedValue = 0.01

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 690

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.02

[Stover].MinimumNConc.FixedValue = 0.02

[Stover].XoBiomass.FixedValue = 1350.0

[Stover].bBiomass.FixedValue = 270.0

1.38 Lentils

Lentils overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 1000

[Phenology].CanopyExpanding.Target.FixedValue = 755.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 595.0

[Product].DryMatterContent.FixedValue = 0.86

[Product].ExpectedYield.FixedValue = 350

[Product].HarvestIndex.FixedValue = 0.5

[Product].MaximumNConc.FixedValue = 0.035

[Product].MinimumNConc.FixedValue = 0.0245

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.687,0.472,0.325,0.223,0.153,0.105,0.072,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.015

[Root].MaximumRootDepth.FixedValue = 700

[Root].MinimumNConc.FixedValue = 0.015

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 690

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 60

[Stover].MaximumNConc.FixedValue = 0.02

[Stover].MinimumNConc.FixedValue = 0.02

[Stover].XoBiomass.FixedValue = 825.0

[Stover].bBiomass.FixedValue = 165.0

1.39 Lettuce

Lettuce overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1299.0

[Phenology].Senescing.Target.FixedValue = 600

[Phenology].YieldIncreasing.Target.FixedValue = 2001.0

[Product].DryMatterContent.FixedValue = 0.05

[Product].ExpectedYield.FixedValue = 5000

[Product].HarvestIndex.FixedValue = 0.8

[Product].MaximumNConc.FixedValue = 0.026

[Product].MinimumNConc.FixedValue = 0.0182

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.472,0.223,0.105,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.009

[Root].MaximumRootDepth.FixedValue = 500

[Root].MinimumNConc.FixedValue = 0.009

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 360

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.8

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.03

[Stover].MinimumNConc.FixedValue = 0.03

[Stover].XoBiomass.FixedValue = 1950.0

[Stover].bBiomass.FixedValue = 390.0

1.40 Linseed

Linseed overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1564.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 1107.0

[Product].DryMatterContent.FixedValue = 0.87

[Product].ExpectedYield.FixedValue = 300

[Product].HarvestIndex.FixedValue = 0.3

[Product].MaximumNConc.FixedValue = 0.03

[Product].MinimumNConc.FixedValue = 0.0091

[Root].KLModifier.XYPairs.Y =
1,1,1,1,1,1,1,0.807,0.651,0.526,0.424,0.343,0.276,0.223,0.18,0.145,0.117,0.095,0.076,0.062,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.009

[Root].MaximumRootDepth.FixedValue = 1000

[Root].MinimumNConc.FixedValue = 0.009

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 540

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.015

[Stover].MinimumNConc.FixedValue = 0.01

[Stover].XoBiomass.FixedValue = 1470.0

[Stover].bBiomass.FixedValue = 294.0

1.41 Lupins

Lupins overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 1000

[Phenology].CanopyExpanding.Target.FixedValue = 420.0

[Phenology].Senescing.Target.FixedValue = 0

[Phenology].YieldIncreasing.Target.FixedValue = 1230.0

[Product].DryMatterContent.FixedValue = 1.0

[Product].ExpectedYield.FixedValue = 1200

[Product].HarvestIndex.FixedValue = 0.9

[Product].MaximumNConc.FixedValue = 0.03

[Product].MinimumNConc.FixedValue = 0.021

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.687,0.472,0.325,0.223,0.153,0.105,0.072,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.015

[Root].MaximumRootDepth.FixedValue = 700

[Root].MinimumNConc.FixedValue = 0.015

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 690

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 60

[Stover].MaximumNConc.FixedValue = 0.03

[Stover].MinimumNConc.FixedValue = 0.03

[Stover].XoBiomass.FixedValue = 825.0

[Stover].bBiomass.FixedValue = 165.0

1.42 Maize_Long

Maize_Long overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1923.0

[Phenology].Senescing.Target.FixedValue = 1800

[Phenology].YieldIncreasing.Target.FixedValue = 477.0

[Product].DryMatterContent.FixedValue = 0.87

[Product].ExpectedYield.FixedValue = 1350

[Product].HarvestIndex.FixedValue = 0.5

[Product].MaximumNConc.FixedValue = 0.014

[Product].MinimumNConc.FixedValue = 0.0098

[Root].KLModifier.XYPairs.Y =
1,1,1,1,1,1,1,0.882,0.779,0.687,0.607,0.535,0.472,0.417,0.368,0.325,0.287,0.253,0.223,0.197,0.174,0.153,0.135,0.119,0.105,0.

[Root].MaximumNConc.FixedValue = 0.007

[Root].MaximumRootDepth.FixedValue = 1500

[Root].MinimumNConc.FixedValue = 0.007

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 1050

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.92

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 180

[Stover].MaximumNConc.FixedValue = 0.007

[Stover].MinimumNConc.FixedValue = 0.007

[Stover].XoBiomass.FixedValue = 2100.0

[Stover].bBiomass.FixedValue = 420.0

1.43 Maize_Med

Maize_Med overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1785.0

[Phenology].Senescing.Target.FixedValue = 1650

[Phenology].YieldIncreasing.Target.FixedValue = 465.0

[Product].DryMatterContent.FixedValue = 0.87

[Product].ExpectedYield.FixedValue = 1330

[Product].HarvestIndex.FixedValue = 0.5

[Product].MaximumNConc.FixedValue = 0.014

[Product].MinimumNConc.FixedValue = 0.0098

[Root].KLModifier.XYPairs.Y =
1,1,1,1,1,1,1,0.882,0.779,0.687,0.607,0.535,0.472,0.417,0.368,0.325,0.287,0.253,0.223,0.197,0.174,0.153,0.135,0.119,0.105,0.

[Root].MaximumNConc.FixedValue = 0.007

[Root].MaximumRootDepth.FixedValue = 1500

[Root].MinimumNConc.FixedValue = 0.007

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 960

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.85

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 180

[Stover].MaximumNConc.FixedValue = 0.007

[Stover].MinimumNConc.FixedValue = 0.007

[Stover].XoBiomass.FixedValue = 1950.0

[Stover].bBiomass.FixedValue = 390.0

1.44 Maize_Short

Maize_Short overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1648.0

[Phenology].Senescing.Target.FixedValue = 1500

[Phenology].YieldIncreasing.Target.FixedValue = 452.0

[Product].DryMatterContent.FixedValue = 0.87

[Product].ExpectedYield.FixedValue = 1220

[Product].HarvestIndex.FixedValue = 0.5

[Product].MaximumNConc.FixedValue = 0.014

[Product].MinimumNConc.FixedValue = 0.0098

[Root].KLModifier.XYPairs.Y =
1,1,1,1,1,1,1,0.882,0.779,0.687,0.607,0.535,0.472,0.417,0.368,0.325,0.287,0.253,0.223,0.197,0.174,0.153,0.135,0.119,0.105,0.

[Root].MaximumNConc.FixedValue = 0.007

[Root].MaximumRootDepth.FixedValue = 1500

[Root].MinimumNConc.FixedValue = 0.007

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 900

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.75

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 180

[Stover].MaximumNConc.FixedValue = 0.007

[Stover].MinimumNConc.FixedValue = 0.007

[Stover].XoBiomass.FixedValue = 1800.0

[Stover].bBiomass.FixedValue = 360.0

1.45 Maizesilage

Maizesilage overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 652.0

[Phenology].Senescing.Target.FixedValue = 1350

[Phenology].YieldIncreasing.Target.FixedValue = 1598.0

[Product].DryMatterContent.FixedValue = 0.35

[Product].ExpectedYield.FixedValue = 5000

[Product].HarvestIndex.FixedValue = 0.95

[Product].MaximumNConc.FixedValue = 0.014

[Product].MinimumNConc.FixedValue = 0.0098

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.882,0.779,0.687,0.607,0.535,0.472,0.417,0.368,0.325,0.287,0.253,0.223,0.197,0.174,0.153,0.135,0.119,0.105,0.

[Root].MaximumNConc.FixedValue = 0.007

[Root].MaximumRootDepth.FixedValue = 1500

[Root].MinimumNConc.FixedValue = 0.007

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 960

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.85

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 180

[Stover].MaximumNConc.FixedValue = 0.007

[Stover].MinimumNConc.FixedValue = 0.007

[Stover].XoBiomass.FixedValue = 1800.0

[Stover].bBiomass.FixedValue = 360.0

1.46 Mustard

Mustard overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 420.0

[Phenology].Senescing.Target.FixedValue = 0

[Phenology].YieldIncreasing.Target.FixedValue = 1230.0

[Product].DryMatterContent.FixedValue = 1.0

[Product].ExpectedYield.FixedValue = 700

[Product].HarvestIndex.FixedValue = 0.9

[Product].MaximumNConc.FixedValue = 0.03

[Product].MinimumNConc.FixedValue = 0.021

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.687,0.472,0.325,0.223,0.153,0.105,0.072,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.01

[Root].MaximumRootDepth.FixedValue = 700

[Root].MinimumNConc.FixedValue = 0.01

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 690

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 60

[Stover].MaximumNConc.FixedValue = 0.03

[Stover].MinimumNConc.FixedValue = 0.03

[Stover].XoBiomass.FixedValue = 825.0

[Stover].bBiomass.FixedValue = 165.0

1.47 Mustard_Seed

Mustard_Seed overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1737.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 904.0

[Product].DryMatterContent.FixedValue = 0.84

[Product].ExpectedYield.FixedValue = 100

[Product].HarvestIndex.FixedValue = 0.1

[Product].MaximumNConc.FixedValue = 0.03

[Product].MinimumNConc.FixedValue = 0.02

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.807,0.651,0.526,0.424,0.343,0.276,0.223,0.18,0.145,0.117,0.095,0.076,0.062,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.008

[Root].MaximumRootDepth.FixedValue = 1000

[Root].MinimumNConc.FixedValue = 0.008

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 540

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.015

[Stover].MinimumNConc.FixedValue = 0.01

[Stover].XoBiomass.FixedValue = 1470.0

[Stover].bBiomass.FixedValue = 294.0

1.48 Oats&Rye

Oats&Rye overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 458.0

[Phenology].Senescing.Target.FixedValue = 0

[Phenology].YieldIncreasing.Target.FixedValue = 1342.0

[Product].DryMatterContent.FixedValue = 1.0

[Product].ExpectedYield.FixedValue = 1000

[Product].HarvestIndex.FixedValue = 0.9

[Product].MaximumNConc.FixedValue = 0.012

[Product].MinimumNConc.FixedValue = 0.0084

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.807,0.651,0.526,0.424,0.343,0.276,0.223,0.18,0.145,0.117,0.095,0.076,0.062,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.009

[Root].MaximumRootDepth.FixedValue = 1000

[Root].MinimumNConc.FixedValue = 0.009

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 540

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.012

[Stover].MinimumNConc.FixedValue = 0.012

[Stover].XoBiomass.FixedValue = 900.0

[Stover].bBiomass.FixedValue = 180.0

1.49 Oats_Autumn

Oats_Autumn overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1546.0

[Phenology].Senescing.Target.FixedValue = 600

[Phenology].YieldIncreasing.Target.FixedValue = 854.0

[Product].DryMatterContent.FixedValue = 0.87

[Product].ExpectedYield.FixedValue = 800

[Product].HarvestIndex.FixedValue = 0.32

[Product].MaximumNConc.FixedValue = 0.013

[Product].MinimumNConc.FixedValue = 0.0091

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.882,0.779,0.687,0.607,0.535,0.472,0.417,0.368,0.325,0.287,0.253,0.223,0.197,0.174,0.153,0.135,0.119,0.105,0.

[Root].MaximumNConc.FixedValue = 0.009

[Root].MaximumRootDepth.FixedValue = 1500

[Root].MinimumNConc.FixedValue = 0.009

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 540

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.005

[Stover].MinimumNConc.FixedValue = 0.005

[Stover].XoBiomass.FixedValue = 1500.0

[Stover].bBiomass.FixedValue = 300.0

1.50 Oats_AutumnForage

Oats_AutumnForage overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 543.0

[Phenology].Senescing.Target.FixedValue = 600

[Phenology].YieldIncreasing.Target.FixedValue = 1857.0

[Product].DryMatterContent.FixedValue = 0.4

[Product].ExpectedYield.FixedValue = 3000

[Product].HarvestIndex.FixedValue = 0.95

[Product].MaximumNConc.FixedValue = 0.016

[Product].MinimumNConc.FixedValue = 0.0091

[Root].KLModifier.XYPairs.Y =
1,1,1,1,1,1,1,0.882,0.779,0.687,0.607,0.535,0.472,0.417,0.368,0.325,0.287,0.253,0.223,0.197,0.174,0.153,0.135,0.119,0.105,0.

[Root].MaximumNConc.FixedValue = 0.009

[Root].MaximumRootDepth.FixedValue = 1500

[Root].MinimumNConc.FixedValue = 0.009

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 540

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.005

[Stover].MinimumNConc.FixedValue = 0.005

[Stover].XoBiomass.FixedValue = 1500.0

[Stover].bBiomass.FixedValue = 300.0

1.51 Oats_Spring

Oats_Spring overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 848.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 652.0

[Product].DryMatterContent.FixedValue = 0.87

[Product].ExpectedYield.FixedValue = 800

[Product].HarvestIndex.FixedValue = 0.46

[Product].MaximumNConc.FixedValue = 0.015

[Product].MinimumNConc.FixedValue = 0.005

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.807,0.651,0.526,0.424,0.343,0.276,0.223,0.18,0.145,0.117,0.095,0.076,0.062,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.009

[Root].MaximumRootDepth.FixedValue = 1000

[Root].MinimumNConc.FixedValue = 0.009

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 540

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.005

[Stover].MinimumNConc.FixedValue = 0.0045

[Stover].XoBiomass.FixedValue = 900.0

[Stover].bBiomass.FixedValue = 180.0

1.52 Oats_SpringForage

Oats_SpringForage overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 326.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 1174.0

[Product].DryMatterContent.FixedValue = 0.4

[Product].ExpectedYield.FixedValue = 2000

[Product].HarvestIndex.FixedValue = 0.95

[Product].MaximumNConc.FixedValue = 0.016

[Product].MinimumNConc.FixedValue = 0.0091

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.882,0.779,0.687,0.607,0.535,0.472,0.417,0.368,0.325,0.287,0.253,0.223,0.197,0.174,0.153,0.135,0.119,0.105,0.

[Root].MaximumNConc.FixedValue = 0.009

[Root].MaximumRootDepth.FixedValue = 1500

[Root].MinimumNConc.FixedValue = 0.009

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 540

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.006

[Stover].MinimumNConc.FixedValue = 0.005

[Stover].XoBiomass.FixedValue = 900.0

[Stover].bBiomass.FixedValue = 180.0

1.53 Onions_Autumn

Onions_Autumn overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 899.0

[Phenology].Senescing.Target.FixedValue = 750

[Phenology].YieldIncreasing.Target.FixedValue = 1051.0

[Product].DryMatterContent.FixedValue = 0.11

[Product].ExpectedYield.FixedValue = 8000

[Product].HarvestIndex.FixedValue = 0.8

[Product].MaximumNConc.FixedValue = 0.014

[Product].MinimumNConc.FixedValue = 0.0098

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.223,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.01

[Root].MaximumRootDepth.FixedValue = 400

[Root].MinimumNConc.FixedValue = 0.01

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 780

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.8

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.02

[Stover].MinimumNConc.FixedValue = 0.02

[Stover].XoBiomass.FixedValue = 1350.0

[Stover].bBiomass.FixedValue = 270.0

1.54 Onions_Spring

Onions_Spring overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 733.0

[Phenology].Senescing.Target.FixedValue = 750

[Phenology].YieldIncreasing.Target.FixedValue = 717.0

[Product].DryMatterContent.FixedValue = 0.11

[Product].ExpectedYield.FixedValue = 7000

[Product].HarvestIndex.FixedValue = 0.8

[Product].MaximumNConc.FixedValue = 0.014

[Product].MinimumNConc.FixedValue = 0.0098

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.223,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.01

[Root].MaximumRootDepth.FixedValue = 400

[Root].MinimumNConc.FixedValue = 0.01

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 780

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.8

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.02

[Stover].MinimumNConc.FixedValue = 0.02

[Stover].XoBiomass.FixedValue = 1100.0

[Stover].bBiomass.FixedValue = 220.0

1.55 PakChoi_Seed

PakChoi_Seed overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 939.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 561.0

[Product].DryMatterContent.FixedValue = 0.84

[Product].ExpectedYield.FixedValue = 200

[Product].HarvestIndex.FixedValue = 0.3

[Product].MaximumNConc.FixedValue = 0.03

[Product].MinimumNConc.FixedValue = 0.02

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.807,0.651,0.526,0.424,0.343,0.276,0.223,0.18,0.145,0.117,0.095,0.076,0.062,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.008

[Root].MaximumRootDepth.FixedValue = 1000

[Root].MinimumNConc.FixedValue = 0.008

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 540

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.02

[Stover].MinimumNConc.FixedValue = 0.02

[Stover].XoBiomass.FixedValue = 900.0

[Stover].bBiomass.FixedValue = 180.0

1.56 Parsnips

Parsnips overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 489.0

[Phenology].Senescing.Target.FixedValue = 750

[Phenology].YieldIncreasing.Target.FixedValue = 1461.0

[Product].DryMatterContent.FixedValue = 0.17

[Product].ExpectedYield.FixedValue = 4400

[Product].HarvestIndex.FixedValue = 0.95

[Product].MaximumNConc.FixedValue = 0.014

[Product].MinimumNConc.FixedValue = 0.0098

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.472,0.223,0.105,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.01

[Root].MaximumRootDepth.FixedValue = 500

[Root].MinimumNConc.FixedValue = 0.01

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 690

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.95

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.02

[Stover].MinimumNConc.FixedValue = 0.02

[Stover].XoBiomass.FixedValue = 1350.0

[Stover].bBiomass.FixedValue = 270.0

1.57 Phacelia

Phacelia overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 420.0

[Phenology].Senescing.Target.FixedValue = 0

[Phenology].YieldIncreasing.Target.FixedValue = 1230.0

[Product].DryMatterContent.FixedValue = 1.0

[Product].ExpectedYield.FixedValue = 500

[Product].HarvestIndex.FixedValue = 0.9

[Product].MaximumNConc.FixedValue = 0.03

[Product].MinimumNConc.FixedValue = 0.021

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.687,0.472,0.325,0.223,0.153,0.105,0.072,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.01

[Root].MaximumRootDepth.FixedValue = 700

[Root].MinimumNConc.FixedValue = 0.01

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 690

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 60

[Stover].MaximumNConc.FixedValue = 0.03

[Stover].MinimumNConc.FixedValue = 0.03

[Stover].XoBiomass.FixedValue = 825.0

[Stover].bBiomass.FixedValue = 165.0

1.58 Plantain_Seed

Plantain_Seed overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 2070.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 1361.0

[Product].DryMatterContent.FixedValue = 0.85

[Product].ExpectedYield.FixedValue = 200

[Product].HarvestIndex.FixedValue = 0.15

[Product].MaximumNConc.FixedValue = 0.03

[Product].MinimumNConc.FixedValue = 0.0105

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.807,0.651,0.526,0.424,0.343,0.276,0.223,0.18,0.145,0.117,0.095,0.076,0.062,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.01

[Root].MaximumRootDepth.FixedValue = 1000

[Root].MinimumNConc.FixedValue = 0.01

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 690

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.95

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.012

[Stover].MinimumNConc.FixedValue = 0.01

[Stover].XoBiomass.FixedValue = 1866.0

[Stover].bBiomass.FixedValue = 370.0

1.59 Potatoes_Long

Potatoes_Long overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 690.0

[Phenology].Senescing.Target.FixedValue = 600

[Phenology].YieldIncreasing.Target.FixedValue = 1560.0

[Product].DryMatterContent.FixedValue = 0.22

[Product].ExpectedYield.FixedValue = 7100

[Product].HarvestIndex.FixedValue = 0.911

[Product].MaximumNConc.FixedValue = 0.018

[Product].MinimumNConc.FixedValue = 0.0126

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.807,0.651,0.526,0.424,0.343,0.276,0.223,0.18,0.145,0.117,0.095,0.076,0.062,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.01

[Root].MaximumRootDepth.FixedValue = 1000

[Root].MinimumNConc.FixedValue = 0.01

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 690

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 60

[Stover].MaximumNConc.FixedValue = 0.02

[Stover].MinimumNConc.FixedValue = 0.02

[Stover].XoBiomass.FixedValue = 1425.0

[Stover].bBiomass.FixedValue = 285.0

1.60 Potatoes_Medium

Potatoes_Medium overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 638.0

[Phenology].Senescing.Target.FixedValue = 600

[Phenology].YieldIncreasing.Target.FixedValue = 1312.0

[Product].DryMatterContent.FixedValue = 0.22

[Product].ExpectedYield.FixedValue = 6400

[Product].HarvestIndex.FixedValue = 0.904

[Product].MaximumNConc.FixedValue = 0.018

[Product].MinimumNConc.FixedValue = 0.0126

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.807,0.651,0.526,0.424,0.343,0.276,0.223,0.18,0.145,0.117,0.095,0.076,0.062,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.01

[Root].MaximumRootDepth.FixedValue = 1000

[Root].MinimumNConc.FixedValue = 0.01

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 690

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 60

[Stover].MaximumNConc.FixedValue = 0.02

[Stover].MinimumNConc.FixedValue = 0.02

[Stover].XoBiomass.FixedValue = 1275.0

[Stover].bBiomass.FixedValue = 255.0

1.61 Potatoes_Short

Potatoes_Short overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 590.0

[Phenology].Senescing.Target.FixedValue = 600

[Phenology].YieldIncreasing.Target.FixedValue = 1060.0

[Product].DryMatterContent.FixedValue = 0.23

[Product].ExpectedYield.FixedValue = 5300

[Product].HarvestIndex.FixedValue = 0.893

[Product].MaximumNConc.FixedValue = 0.018

[Product].MinimumNConc.FixedValue = 0.0126

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.807,0.651,0.526,0.424,0.343,0.276,0.223,0.18,0.145,0.117,0.095,0.076,0.062,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.01

[Root].MaximumRootDepth.FixedValue = 1000

[Root].MinimumNConc.FixedValue = 0.01

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 690

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 60

[Stover].MaximumNConc.FixedValue = 0.02

[Stover].MinimumNConc.FixedValue = 0.02

[Stover].XoBiomass.FixedValue = 1125.0

[Stover].bBiomass.FixedValue = 225.0

1.62 Radish_Seed

Radish_Seed overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1737.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 904.0

[Product].DryMatterContent.FixedValue = 0.84

[Product].ExpectedYield.FixedValue = 170

[Product].HarvestIndex.FixedValue = 0.16

[Product].MaximumNConc.FixedValue = 0.049

[Product].MinimumNConc.FixedValue = 0.02

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.807,0.651,0.526,0.424,0.343,0.276,0.223,0.18,0.145,0.117,0.095,0.076,0.062,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.008

[Root].MaximumRootDepth.FixedValue = 1000

[Root].MinimumNConc.FixedValue = 0.008

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 540

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.0102

[Stover].MinimumNConc.FixedValue = 0.006

[Stover].XoBiomass.FixedValue = 1470.0

[Stover].bBiomass.FixedValue = 294.0

1.63 Rape

Rape overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 999.0

[Phenology].Senescing.Target.FixedValue = 0

[Phenology].YieldIncreasing.Target.FixedValue = 2001.0

[Product].DryMatterContent.FixedValue = 0.13

[Product].ExpectedYield.FixedValue = 4615

[Product].HarvestIndex.FixedValue = 0.8

[Product].MaximumNConc.FixedValue = 0.037

[Product].MinimumNConc.FixedValue = 0.02

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.931,0.867,0.807,0.751,0.7,0.651,0.607,0.565,0.526,0.49,0.456,0.424,0.395,0.368,0.343,0.319,0.297,0.276,0.257

[Root].MaximumNConc.FixedValue = 0.008

[Root].MaximumRootDepth.FixedValue = 2400

[Root].MinimumNConc.FixedValue = 0.008

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 770

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 57

[Stover].MaximumNConc.FixedValue = 0.01

[Stover].MinimumNConc.FixedValue = 0.01

[Stover].XoBiomass.FixedValue = 1500.0

[Stover].bBiomass.FixedValue = 300.0

1.64 Rape_Seed

Rape_Seed overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1465.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 716.0

[Product].DryMatterContent.FixedValue = 0.84

[Product].ExpectedYield.FixedValue = 170

[Product].HarvestIndex.FixedValue = 0.1

[Product].MaximumNConc.FixedValue = 0.037

[Product].MinimumNConc.FixedValue = 0.02

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.807,0.651,0.526,0.424,0.343,0.276,0.223,0.18,0.145,0.117,0.095,0.076,0.062,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.008

[Root].MaximumRootDepth.FixedValue = 1000

[Root].MinimumNConc.FixedValue = 0.008

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 540

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.02

[Stover].MinimumNConc.FixedValue = 0.02

[Stover].XoBiomass.FixedValue = 1240.0

[Stover].bBiomass.FixedValue = 248.0

1.65 RyeCorn_Autumn

RyeCorn_Autumn overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 543.0

[Phenology].Senescing.Target.FixedValue = 600

[Phenology].YieldIncreasing.Target.FixedValue = 1857.0

[Product].DryMatterContent.FixedValue = 0.4

[Product].ExpectedYield.FixedValue = 3000

[Product].HarvestIndex.FixedValue = 0.95

[Product].MaximumNConc.FixedValue = 0.013

[Product].MinimumNConc.FixedValue = 0.0091

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.882,0.779,0.687,0.607,0.535,0.472,0.417,0.368,0.325,0.287,0.253,0.223,0.197,0.174,0.153,0.135,0.119,0.105,0.

[Root].MaximumNConc.FixedValue = 0.009

[Root].MaximumRootDepth.FixedValue = 1500

[Root].MinimumNConc.FixedValue = 0.009

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 540

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.005

[Stover].MinimumNConc.FixedValue = 0.005

[Stover].XoBiomass.FixedValue = 1500.0

[Stover].bBiomass.FixedValue = 300.0

1.66 RyeCorn_Spring

RyeCorn_Spring overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 326.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 1174.0

[Product].DryMatterContent.FixedValue = 0.4

[Product].ExpectedYield.FixedValue = 2000

[Product].HarvestIndex.FixedValue = 0.95

[Product].MaximumNConc.FixedValue = 0.02

[Product].MinimumNConc.FixedValue = 0.0091

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.882,0.779,0.687,0.607,0.535,0.472,0.417,0.368,0.325,0.287,0.253,0.223,0.197,0.174,0.153,0.135,0.119,0.105,0.

[Root].MaximumNConc.FixedValue = 0.009

[Root].MaximumRootDepth.FixedValue = 1500

[Root].MinimumNConc.FixedValue = 0.009

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 540

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.005

[Stover].MinimumNConc.FixedValue = 0.005

[Stover].XoBiomass.FixedValue = 900.0

[Stover].bBiomass.FixedValue = 180.0

1.67 Ryegrass_1styear

Ryegrass_1styear overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1590.0

[Phenology].Senescing.Target.FixedValue = 450

[Phenology].YieldIncreasing.Target.FixedValue = 660.0

[Product].DryMatterContent.FixedValue = 0.85

[Product].ExpectedYield.FixedValue = 150

[Product].HarvestIndex.FixedValue = 0.105

[Product].MaximumNConc.FixedValue = 0.02

[Product].MinimumNConc.FixedValue = 0.0105

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.807,0.651,0.526,0.424,0.343,0.276,0.223,0.18,0.145,0.117,0.095,0.076,0.062,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.01

[Root].MaximumRootDepth.FixedValue = 1000

[Root].MinimumNConc.FixedValue = 0.01

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 540

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.015

[Stover].MinimumNConc.FixedValue = 0.015

[Stover].XoBiomass.FixedValue = 1350.0

[Stover].bBiomass.FixedValue = 270.0

1.68 Ryegrass_2ndyear

Ryegrass_2ndyear overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1237.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 563.0

[Product].DryMatterContent.FixedValue = 0.85

[Product].ExpectedYield.FixedValue = 150

[Product].HarvestIndex.FixedValue = 0.105

[Product].MaximumNConc.FixedValue = 0.02

[Product].MinimumNConc.FixedValue = 0.0105

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.807,0.651,0.526,0.424,0.343,0.276,0.223,0.18,0.145,0.117,0.095,0.076,0.062,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.01

[Root].MaximumRootDepth.FixedValue = 1000

[Root].MinimumNConc.FixedValue = 0.01

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 300

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.015

[Stover].MinimumNConc.FixedValue = 0.015

[Stover].XoBiomass.FixedValue = 1050.0

[Stover].bBiomass.FixedValue = 210.0

1.69 Spinach

Spinach overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1150.0

[Phenology].Senescing.Target.FixedValue = 900

[Phenology].YieldIncreasing.Target.FixedValue = 950.0

[Product].DryMatterContent.FixedValue = 0.05

[Product].ExpectedYield.FixedValue = 2200

[Product].HarvestIndex.FixedValue = 0.7

[Product].MaximumNConc.FixedValue = 0.03

[Product].MinimumNConc.FixedValue = 0.021

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.472,0.223,0.105,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.009

[Root].MaximumRootDepth.FixedValue = 500

[Root].MinimumNConc.FixedValue = 0.009

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 360

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.8

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.015

[Stover].MinimumNConc.FixedValue = 0.015

[Stover].XoBiomass.FixedValue = 1500.0

[Stover].bBiomass.FixedValue = 300.0

1.70 Spinach_Seed

Spinach_Seed overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1534.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 1107.0

[Product].DryMatterContent.FixedValue = 0.84

[Product].ExpectedYield.FixedValue = 300

[Product].HarvestIndex.FixedValue = 0.3

[Product].MaximumNConc.FixedValue = 0.037

[Product].MinimumNConc.FixedValue = 0.02

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.807,0.651,0.526,0.424,0.343,0.276,0.223,0.18,0.145,0.117,0.095,0.076,0.062,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.008

[Root].MaximumRootDepth.FixedValue = 1000

[Root].MinimumNConc.FixedValue = 0.008

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 540

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.02

[Stover].MinimumNConc.FixedValue = 0.02

[Stover].XoBiomass.FixedValue = 1470.0

[Stover].bBiomass.FixedValue = 294.0

1.71 SpringOnion_seed

SpringOnion_seed overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1737.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 904.0

[Product].DryMatterContent.FixedValue = 0.84

[Product].ExpectedYield.FixedValue = 170

[Product].HarvestIndex.FixedValue = 0.15

[Product].MaximumNConc.FixedValue = 0.03

[Product].MinimumNConc.FixedValue = 0.02

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.807,0.651,0.526,0.424,0.343,0.276,0.223,0.18,0.145,0.117,0.095,0.076,0.062,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.008

[Root].MaximumRootDepth.FixedValue = 1000

[Root].MinimumNConc.FixedValue = 0.008

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 540

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.02

[Stover].MinimumNConc.FixedValue = 0.02

[Stover].XoBiomass.FixedValue = 1470.0

[Stover].bBiomass.FixedValue = 294.0

1.72 Squash

Squash overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 899.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 1501.0

[Product].DryMatterContent.FixedValue = 0.2

[Product].ExpectedYield.FixedValue = 2500

[Product].HarvestIndex.FixedValue = 0.8

[Product].MaximumNConc.FixedValue = 0.02

[Product].MinimumNConc.FixedValue = 0.014

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.472,0.223,0.105,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.01

[Root].MaximumRootDepth.FixedValue = 500

[Root].MinimumNConc.FixedValue = 0.01

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 600

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.94

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 90

[Stover].MaximumNConc.FixedValue = 0.02

[Stover].MinimumNConc.FixedValue = 0.02

[Stover].XoBiomass.FixedValue = 1350.0

[Stover].bBiomass.FixedValue = 270.0

1.73 Sweetcorn

Sweetcorn overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 794.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 706.0

[Product].DryMatterContent.FixedValue = 0.55

[Product].ExpectedYield.FixedValue = 2500

[Product].HarvestIndex.FixedValue = 0.55

[Product].MaximumNConc.FixedValue = 0.0165

[Product].MinimumNConc.FixedValue = 0.0098

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.807,0.651,0.526,0.424,0.343,0.276,0.223,0.18,0.145,0.117,0.095,0.076,0.062,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.007

[Root].MaximumRootDepth.FixedValue = 1000

[Root].MinimumNConc.FixedValue = 0.007

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 540

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.75

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.009

[Stover].MinimumNConc.FixedValue = 0.009

[Stover].XoBiomass.FixedValue = 900.0

[Stover].bBiomass.FixedValue = 180.0

1.74 Tall_Fescue

Tall_Fescue overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1237.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 563.0

[Product].DryMatterContent.FixedValue = 0.85

[Product].ExpectedYield.FixedValue = 200

[Product].HarvestIndex.FixedValue = 0.105

[Product].MaximumNConc.FixedValue = 0.02

[Product].MinimumNConc.FixedValue = 0.0105

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.807,0.651,0.526,0.424,0.343,0.276,0.223,0.18,0.145,0.117,0.095,0.076,0.062,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.01

[Root].MaximumRootDepth.FixedValue = 1000

[Root].MinimumNConc.FixedValue = 0.01

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 300

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.018

[Stover].MinimumNConc.FixedValue = 0.015

[Stover].XoBiomass.FixedValue = 1050.0

[Stover].bBiomass.FixedValue = 210.0

1.75 Tomato

Tomato overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1236.0

[Phenology].Senescing.Target.FixedValue = 750

[Phenology].YieldIncreasing.Target.FixedValue = 714.0

[Product].DryMatterContent.FixedValue = 0.05

[Product].ExpectedYield.FixedValue = 10000

[Product].HarvestIndex.FixedValue = 0.5

[Product].MaximumNConc.FixedValue = 0.03

[Product].MinimumNConc.FixedValue = 0.014

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.472,0.223,0.105,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.01

[Root].MaximumRootDepth.FixedValue = 500

[Root].MinimumNConc.FixedValue = 0.01

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 690

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.02

[Stover].MinimumNConc.FixedValue = 0.02

[Stover].XoBiomass.FixedValue = 1350.0

[Stover].bBiomass.FixedValue = 270.0

1.76 Triticalie_Autumn

Triticalie_Autumn overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 543.0

[Phenology].Senescing.Target.FixedValue = 600

[Phenology].YieldIncreasing.Target.FixedValue = 1857.0

[Product].DryMatterContent.FixedValue = 0.4

[Product].ExpectedYield.FixedValue = 3000

[Product].HarvestIndex.FixedValue = 0.95

[Product].MaximumNConc.FixedValue = 0.013

[Product].MinimumNConc.FixedValue = 0.0091

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.882,0.779,0.687,0.607,0.535,0.472,0.417,0.368,0.325,0.287,0.253,0.223,0.197,0.174,0.153,0.135,0.119,0.105,0.

[Root].MaximumNConc.FixedValue = 0.009

[Root].MaximumRootDepth.FixedValue = 1500

[Root].MinimumNConc.FixedValue = 0.009

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 540

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.005

[Stover].MinimumNConc.FixedValue = 0.005

[Stover].XoBiomass.FixedValue = 1500.0

[Stover].bBiomass.FixedValue = 300.0

1.77 Triticalie_Grain

Triticalie_Grain overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1461.0

[Phenology].Senescing.Target.FixedValue = 600

[Phenology].YieldIncreasing.Target.FixedValue = 939.0

[Product].DryMatterContent.FixedValue = 0.87

[Product].ExpectedYield.FixedValue = 1100

[Product].HarvestIndex.FixedValue = 0.41

[Product].MaximumNConc.FixedValue = 0.015

[Product].MinimumNConc.FixedValue = 0.0091

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.882,0.779,0.687,0.607,0.535,0.472,0.417,0.368,0.325,0.287,0.253,0.223,0.197,0.174,0.153,0.135,0.119,0.105,0.

[Root].MaximumNConc.FixedValue = 0.009

[Root].MaximumRootDepth.FixedValue = 1500

[Root].MinimumNConc.FixedValue = 0.009

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 540

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.005

[Stover].MinimumNConc.FixedValue = 0.005

[Stover].XoBiomass.FixedValue = 1500.0

[Stover].bBiomass.FixedValue = 300.0

1.78 Triticalie_Spring

Triticalie_Spring overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 326.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 1174.0

[Product].DryMatterContent.FixedValue = 0.4

[Product].ExpectedYield.FixedValue = 2000

[Product].HarvestIndex.FixedValue = 0.95

[Product].MaximumNConc.FixedValue = 0.013

[Product].MinimumNConc.FixedValue = 0.0091

[Root].KLModifier.XYPairs.Y =
1,1,1,1,1,1,1,0.882,0.779,0.687,0.607,0.535,0.472,0.417,0.368,0.325,0.287,0.253,0.223,0.197,0.174,0.153,0.135,0.119,0.105,0.

[Root].MaximumNConc.FixedValue = 0.009

[Root].MaximumRootDepth.FixedValue = 1500

[Root].MinimumNConc.FixedValue = 0.009

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 540

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.005

[Stover].MinimumNConc.FixedValue = 0.005

[Stover].XoBiomass.FixedValue = 900.0

[Stover].bBiomass.FixedValue = 180.0

1.79 Turnip_Seed

Turnip_Seed overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1717.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 983.0

[Product].DryMatterContent.FixedValue = 0.84

[Product].ExpectedYield.FixedValue = 170

[Product].HarvestIndex.FixedValue = 0.15

[Product].MaximumNConc.FixedValue = 0.037

[Product].MinimumNConc.FixedValue = 0.011

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.882,0.779,0.687,0.607,0.535,0.472,0.417,0.368,0.325,0.287,0.253,0.223,0.197,0.174,0.153,0.135,0.119,0.105,0.

[Root].MaximumNConc.FixedValue = 0.008

[Root].MaximumRootDepth.FixedValue = 1500

[Root].MinimumNConc.FixedValue = 0.009

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 540

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.01

[Stover].MinimumNConc.FixedValue = 0.01

[Stover].XoBiomass.FixedValue = 1500.0

[Stover].bBiomass.FixedValue = 300.0

1.80 Wheat_Autumn

Wheat_Autumn overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 1461.0

[Phenology].Senescing.Target.FixedValue = 600

[Phenology].YieldIncreasing.Target.FixedValue = 939.0

[Product].DryMatterContent.FixedValue = 0.87

[Product].ExpectedYield.FixedValue = 1200

[Product].HarvestIndex.FixedValue = 0.51

[Product].MaximumNConc.FixedValue = 0.0205

[Product].MinimumNConc.FixedValue = 0.01

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.882,0.779,0.687,0.607,0.535,0.472,0.417,0.368,0.325,0.287,0.253,0.223,0.197,0.174,0.153,0.135,0.119,0.105,0.

[Root].MaximumNConc.FixedValue = 0.009

[Root].MaximumRootDepth.FixedValue = 1500

[Root].MinimumNConc.FixedValue = 0.009

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 540

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.0069

[Stover].MinimumNConc.FixedValue = 0.0069

[Stover].XoBiomass.FixedValue = 1500.0

[Stover].bBiomass.FixedValue = 300.0

1.81 Wheat_Spring

Wheat_Spring overrides the following properties:

[Nodule].FixationMetabolicCost.FixedValue = 0

[Nodule].FixationRate.FixedValue = 0

[Phenology].CanopyExpanding.Target.FixedValue = 848.0

[Phenology].Senescing.Target.FixedValue = 300

[Phenology].YieldIncreasing.Target.FixedValue = 652.0

[Product].DryMatterContent.FixedValue = 0.87

[Product].ExpectedYield.FixedValue = 900

[Product].HarvestIndex.FixedValue = 0.46

[Product].MaximumNConc.FixedValue = 0.0205

[Product].MinimumNConc.FixedValue = 0.01

[Root].KLModifier.XYPairs.Y = 1,1,1,1,1,1,1,0.807,0.651,0.526,0.424,0.343,0.276,0.223,0.18,0.145,0.117,0.095,0.076,0.062,0,0,0,0,0,0,0,0,0,0

[Root].MaximumNConc.FixedValue = 0.009

[Root].MaximumRootDepth.FixedValue = 1000

[Root].MinimumNConc.FixedValue = 0.009

[Root].RootProportion.FixedValue = 0.1

[Stover].Cover.Expanding.SigCoverFunction.Xo.FixedValue = 540

[Stover].Cover.Expanding.SigCoverFunction.Ymax.FixedValue = 0.96

[Stover].Cover.Expanding.SigCoverFunction.b.FixedValue = 120

[Stover].MaximumNConc.FixedValue = 0.0069

[Stover].MinimumNConc.FixedValue = 0.0069

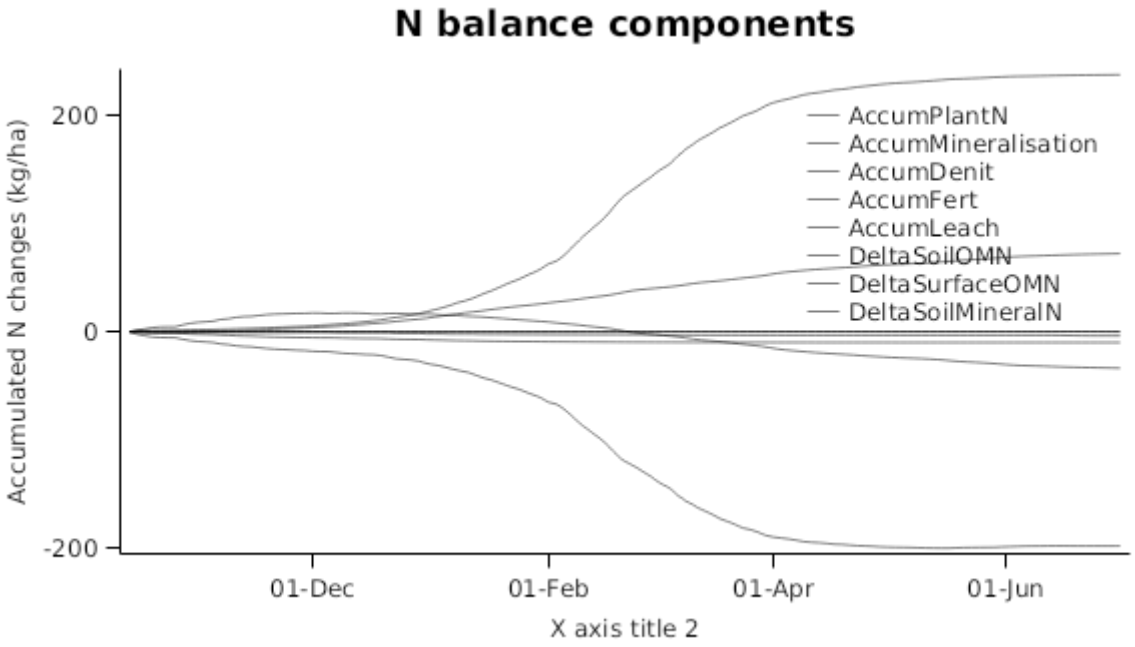
[Stover].XoBiomass.FixedValue = 900.0

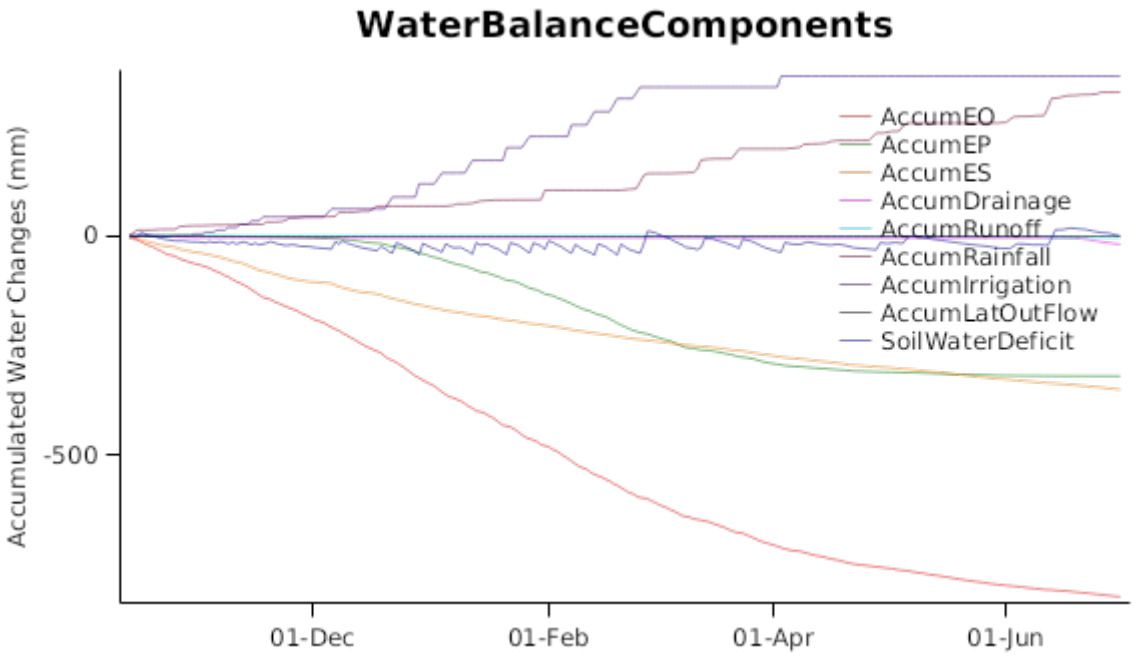
[Stover].bBiomass.FixedValue = 180.0

1.82 MortalityRate

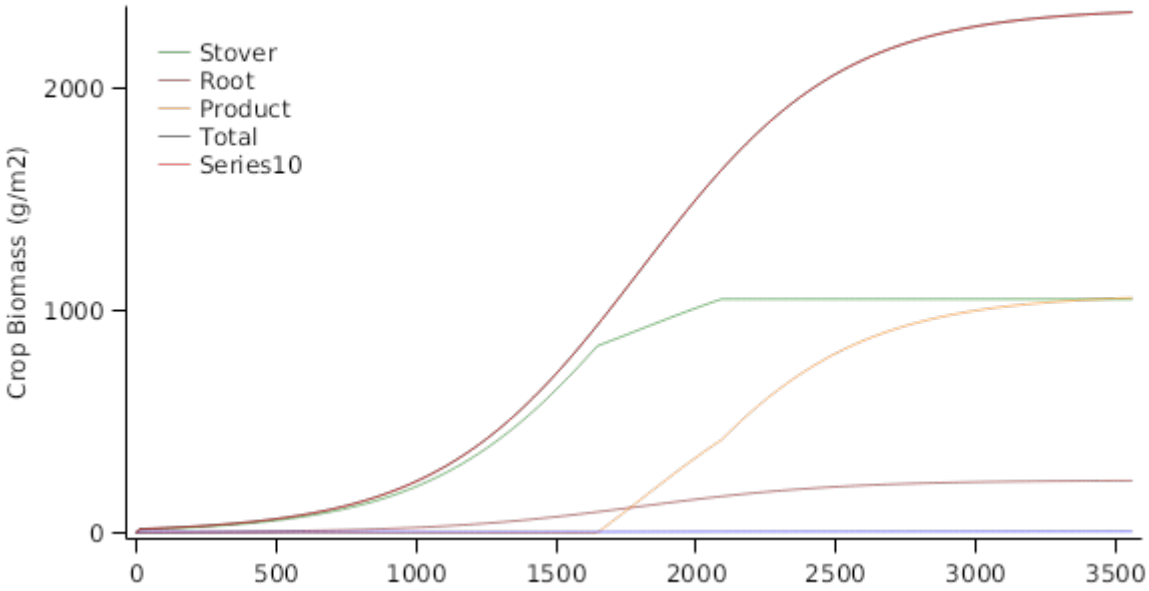
MortalityRate = 0

2 SCRUMTestBase

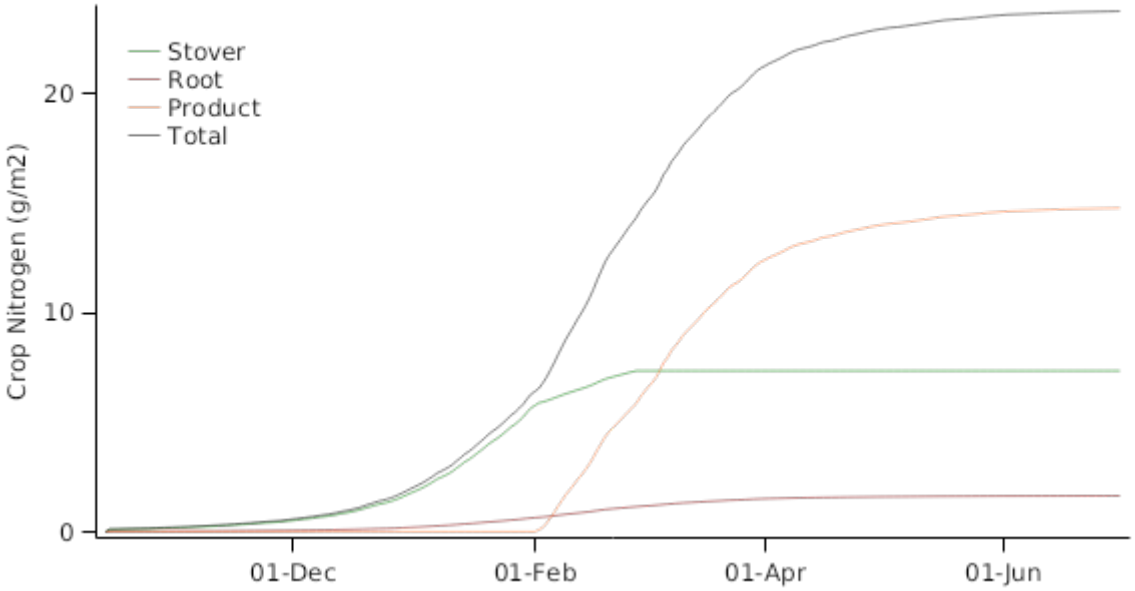

N balance components
Accumulated N changes (kg/ha)
200
0
-200
AccumPlantN
AccumMineralisation
AccumDenit
AccumFert
AccumLeach
DeltaSoilOMN
DeltaSurfaceOMN
DeltaSoilMineralN
01-Dec
01-Feb
01-Apr
01-Jun
X axis title 2


WaterBalanceComponents
Accumulated Water Changes (mm)
0
-500
AccumEO
AccumEP
AccumES
AccumDrainage
AccumRunoff
AccumRainfall
AccumIrrigation
AccumLatOutFlow
SoilWaterDeficit
01-Dec
01-Feb
01-Apr
01-Jun

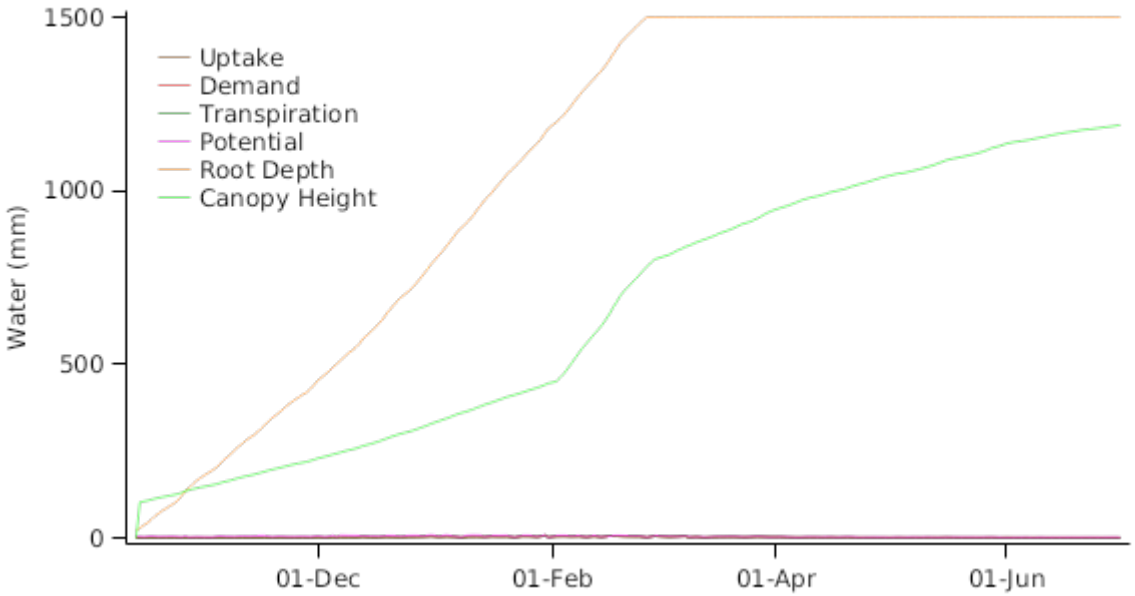
Plant Biomass components



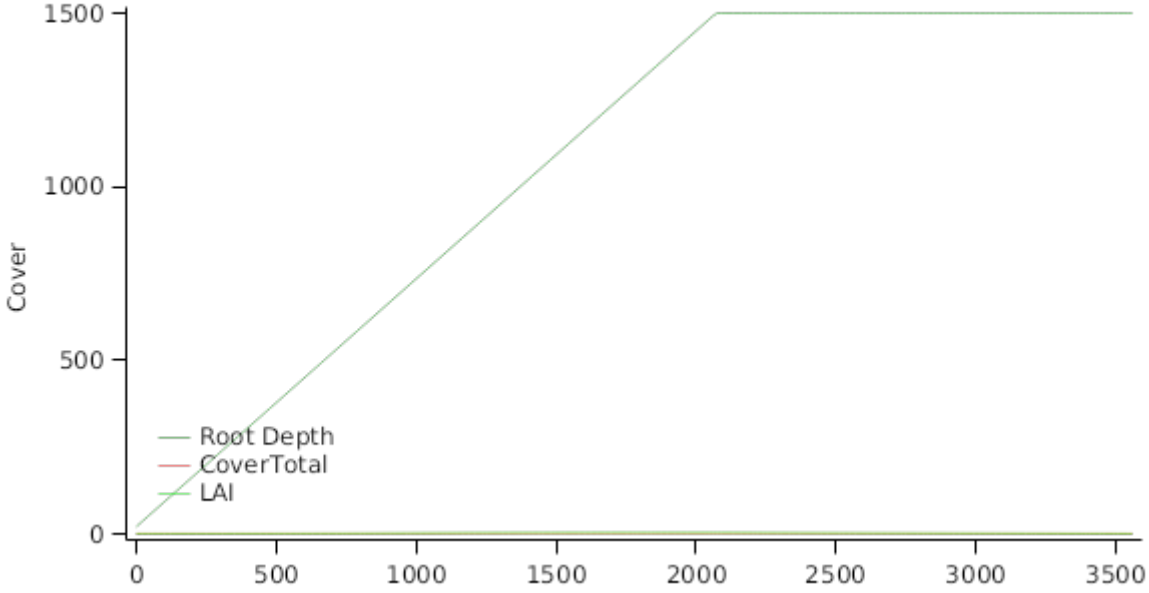
Plant Nitrogen components



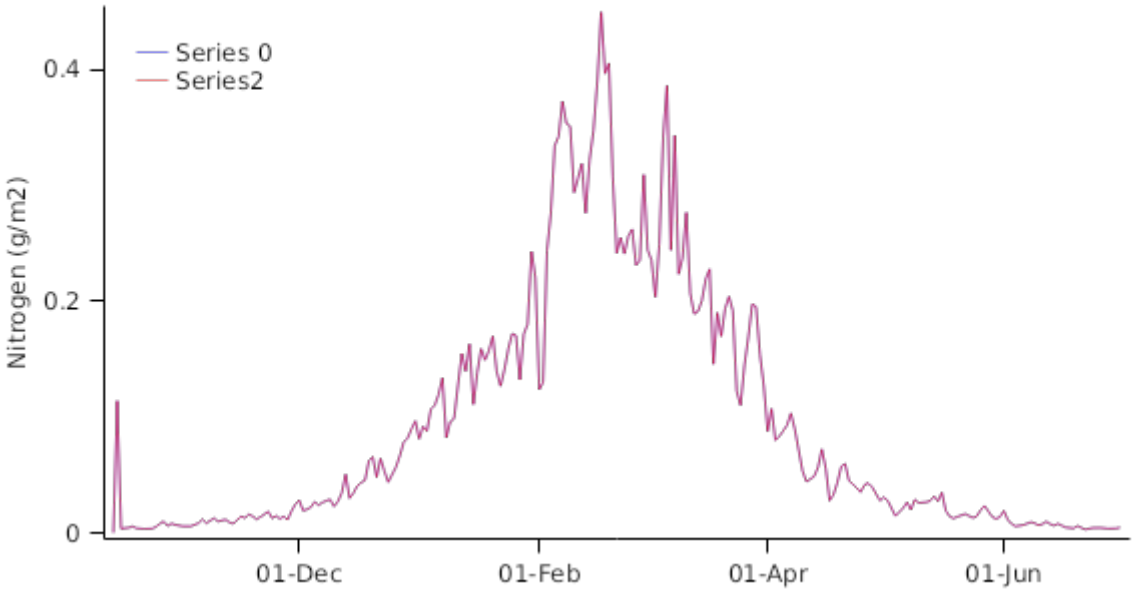
Water supply and demand



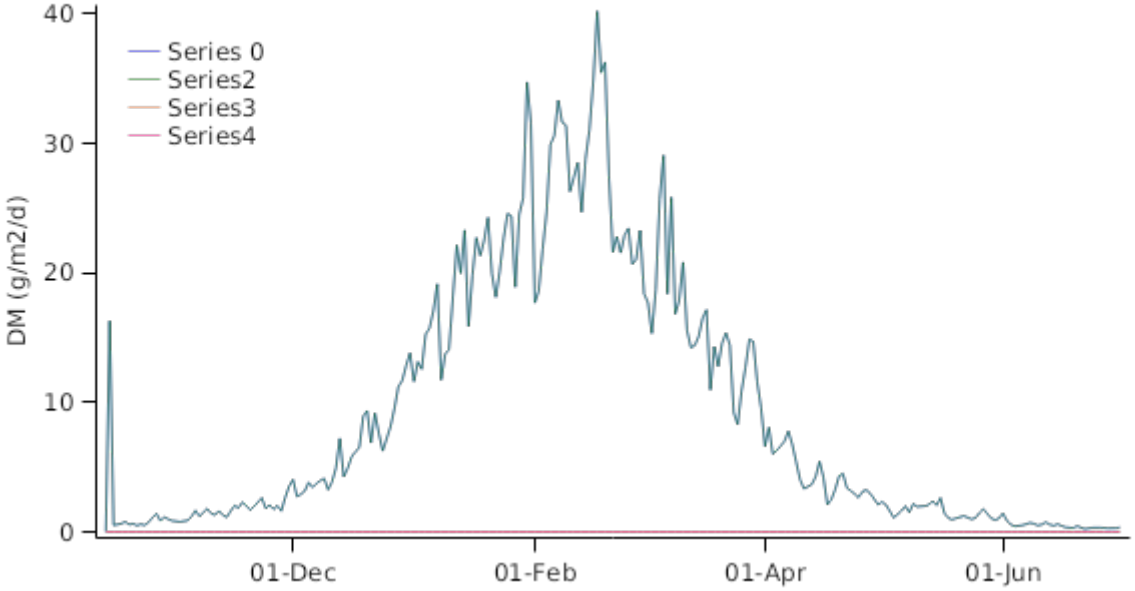
Crop structure

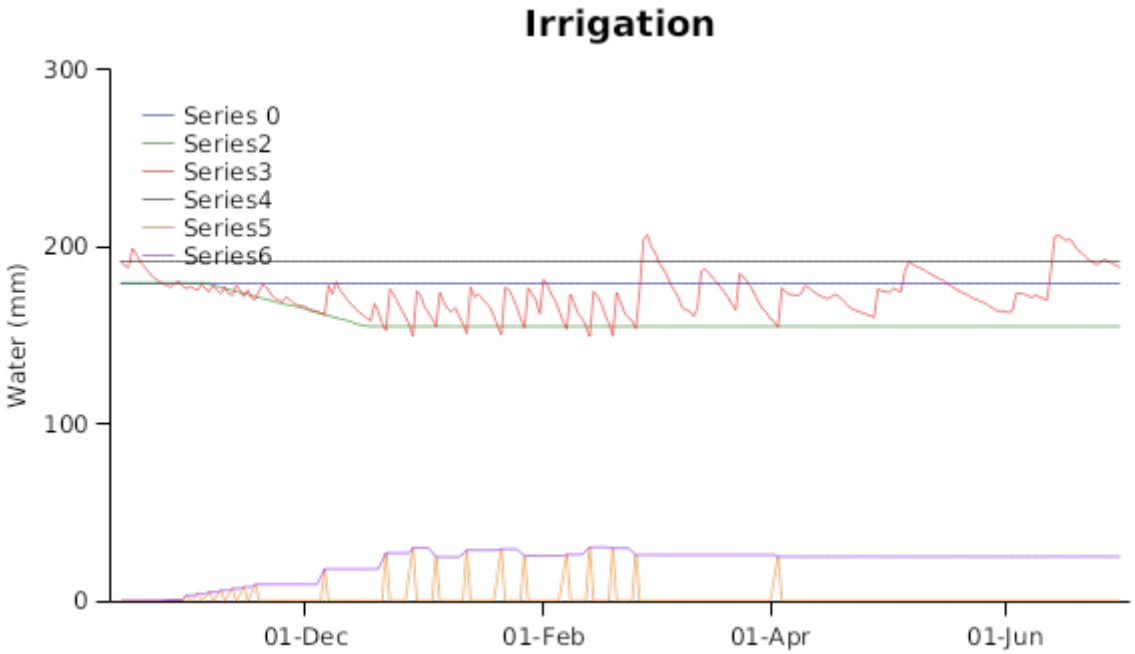


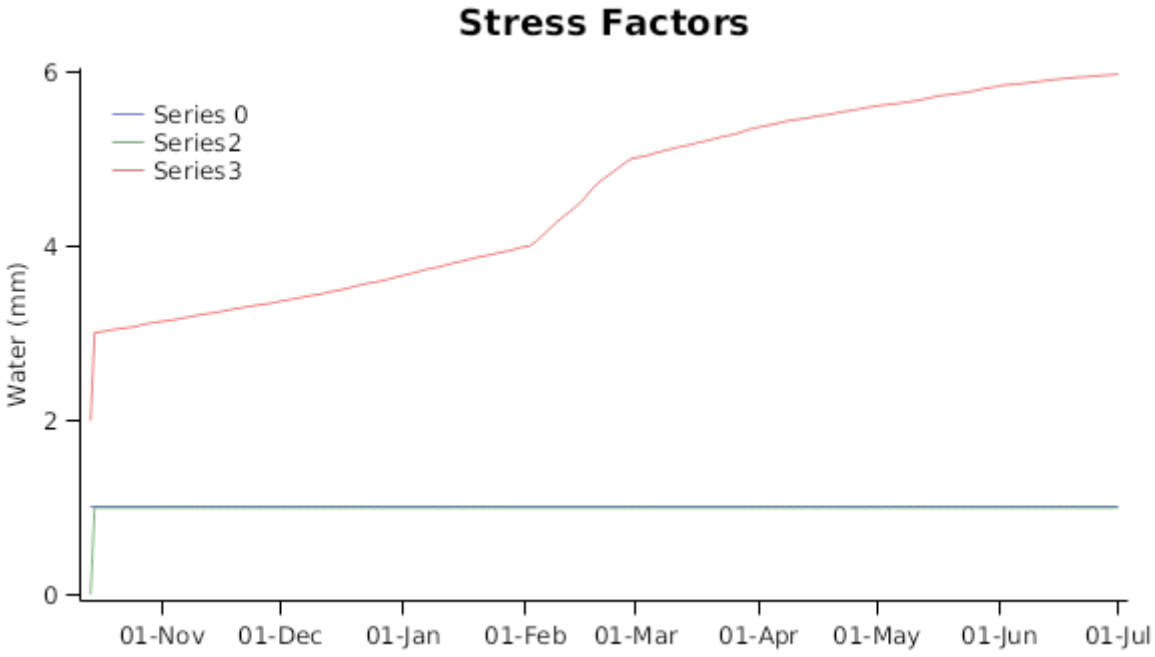
N supply and demand



DM supply and demand



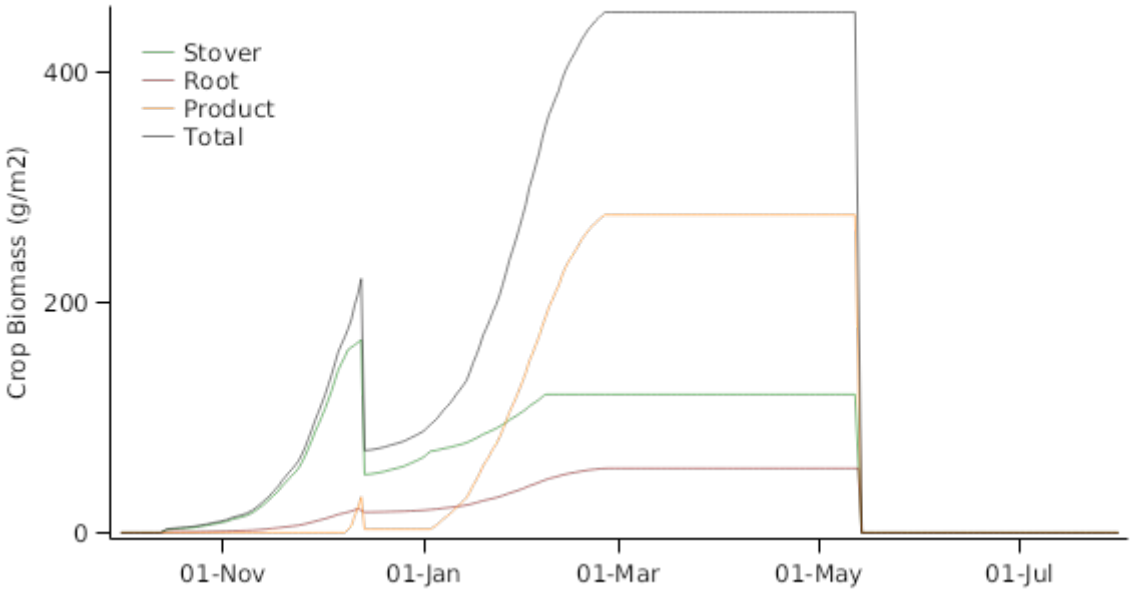




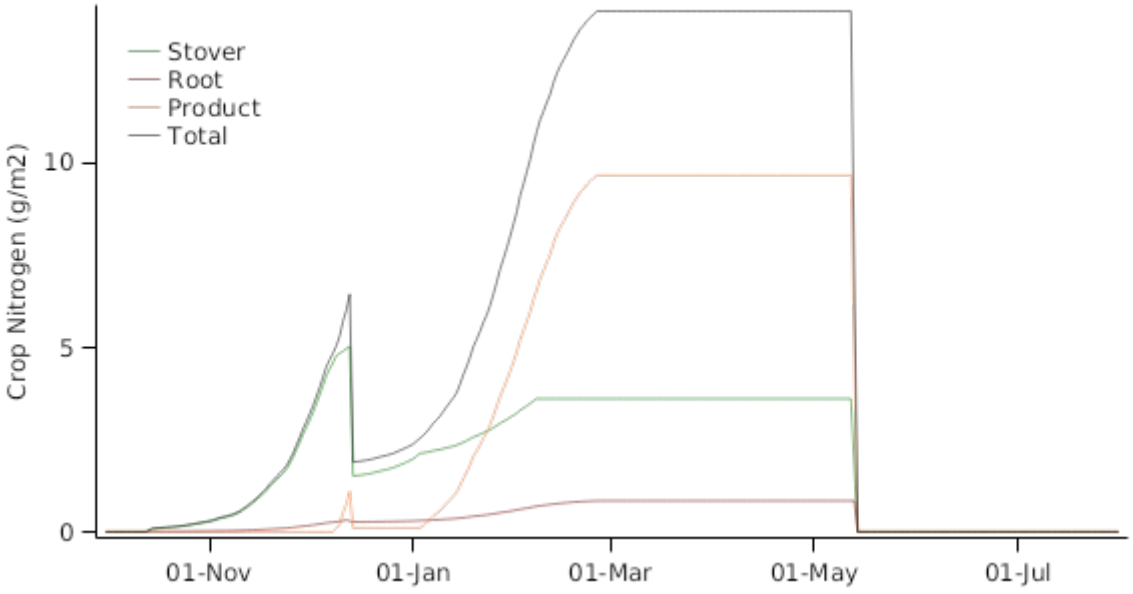
3 Simple test with Biomass Cut

In this test an Autumn wheat crop is planted, and defoliated part way through its growth. The series of graphs show how SCRUM accumulates biomass and nitrogen and what happens when a biomass removal event is invoked. The also demonstrate that componenst of the Nitrogen and water balances are behaving sensibly with the inclusion of SCRUM in a simulation.

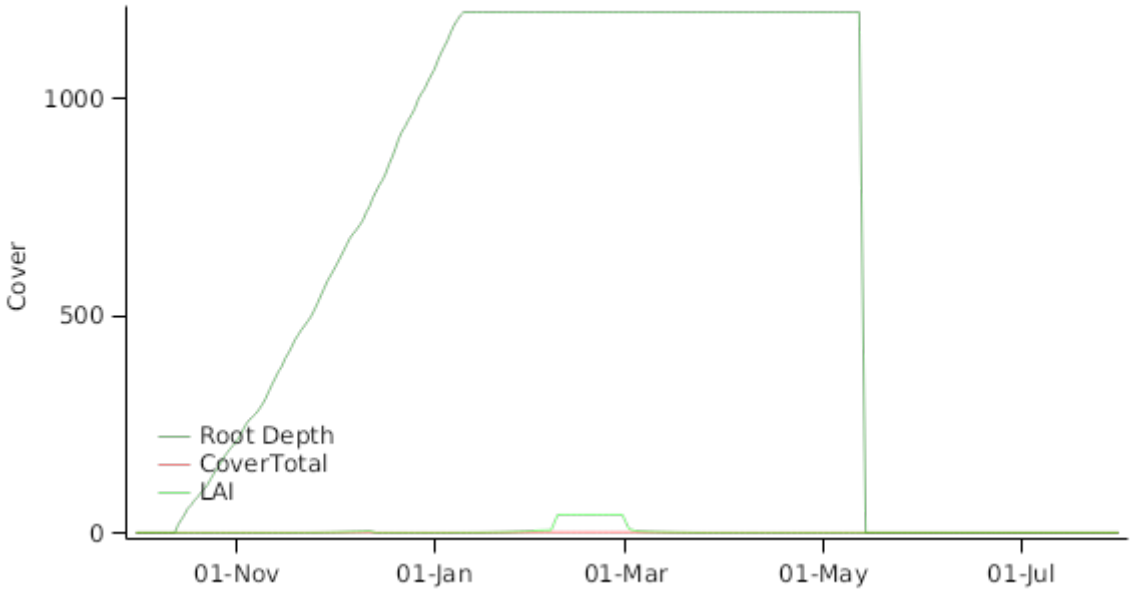
Plant Biomass components



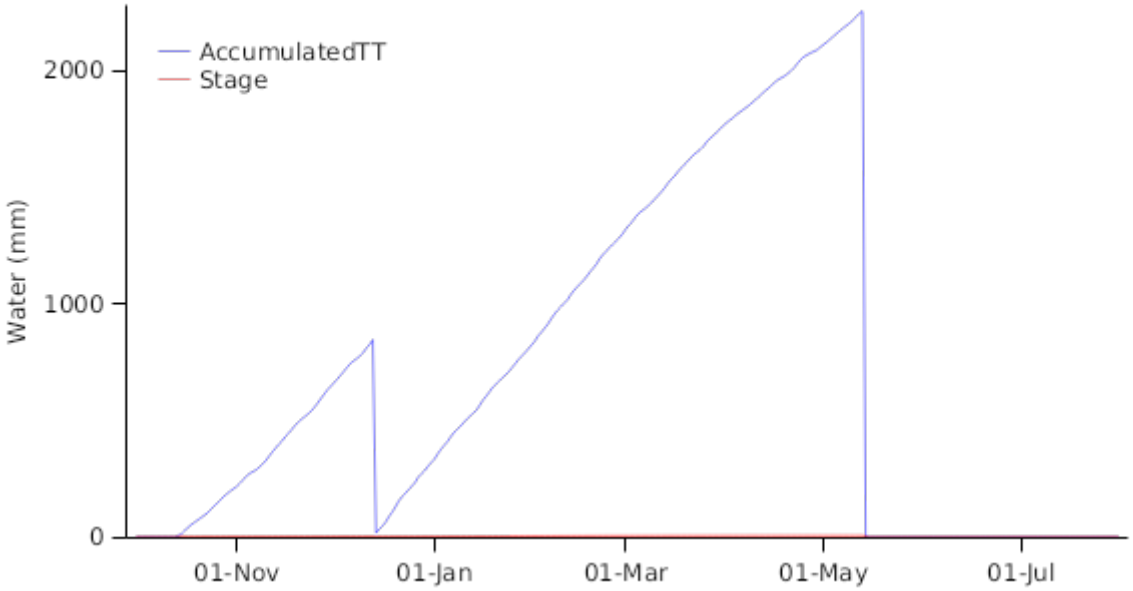
Plant Nitrogen components



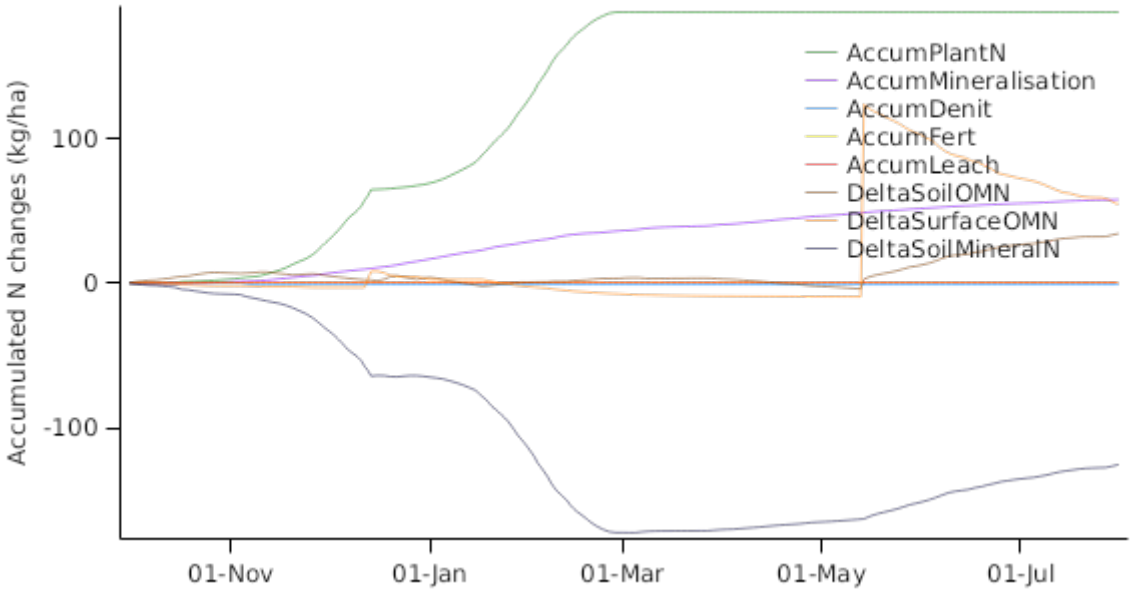
Crop structure



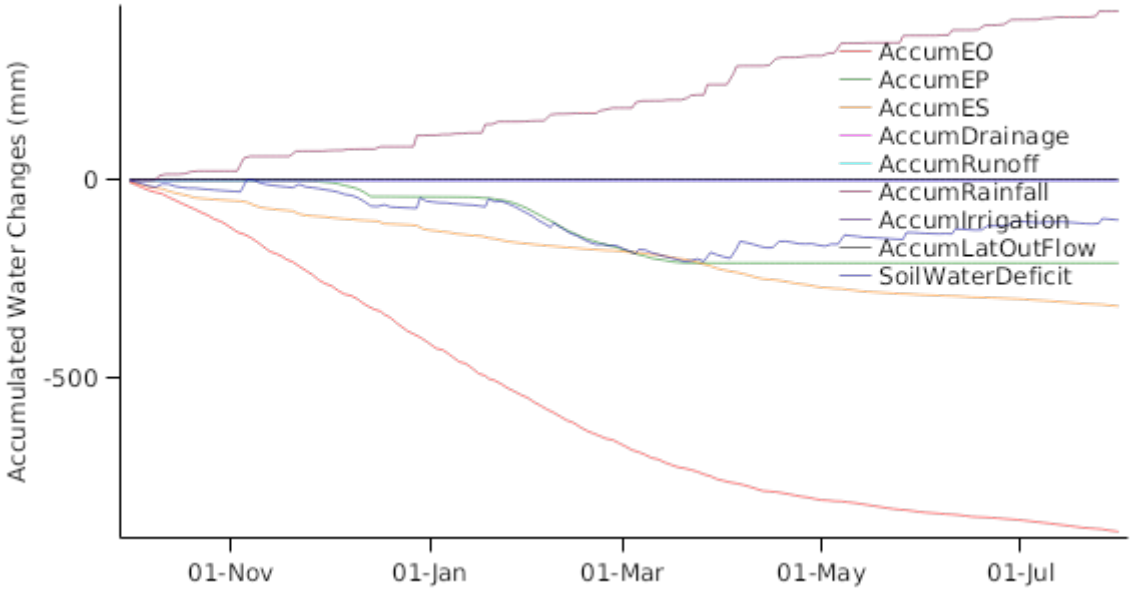
Phenology



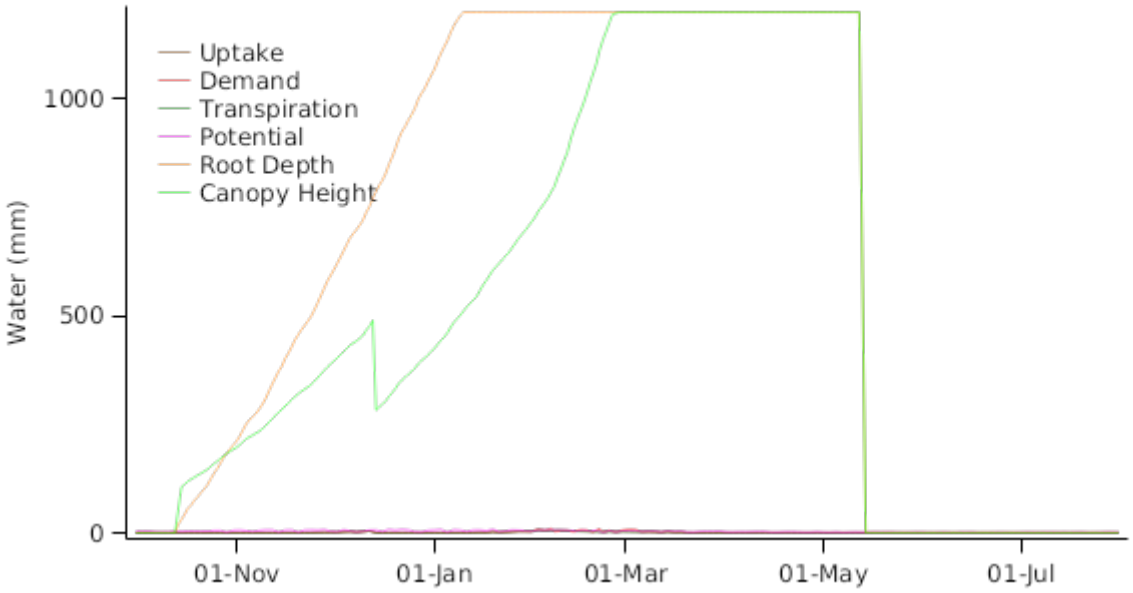
N balance components



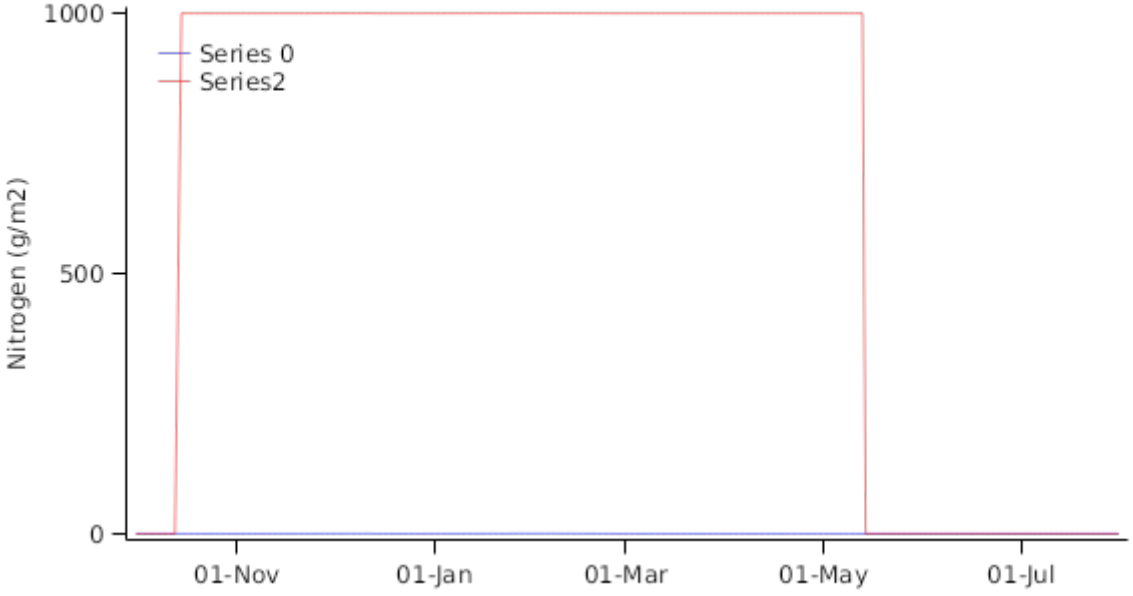
WaterBalanceComponents

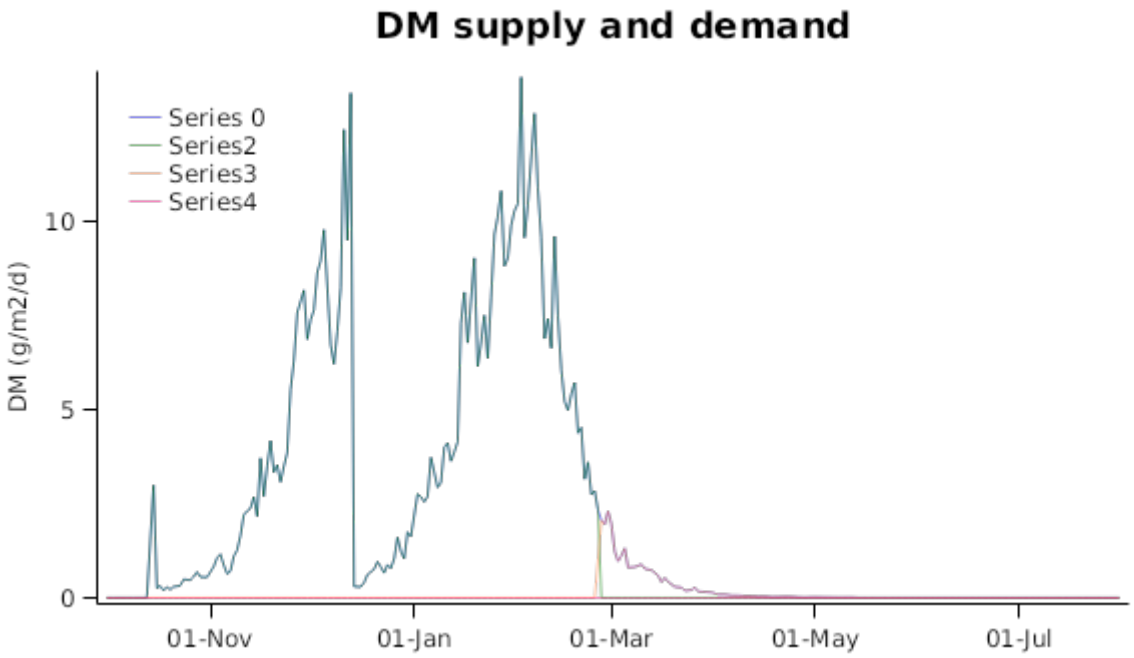


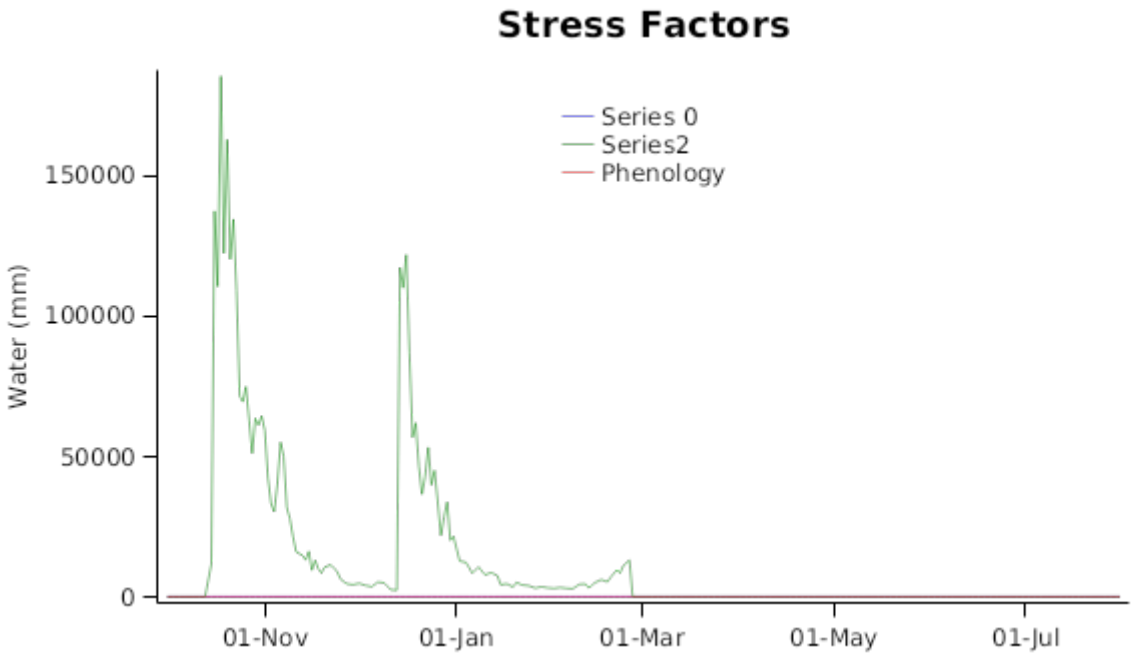
Water supply and demand



N supply and demand



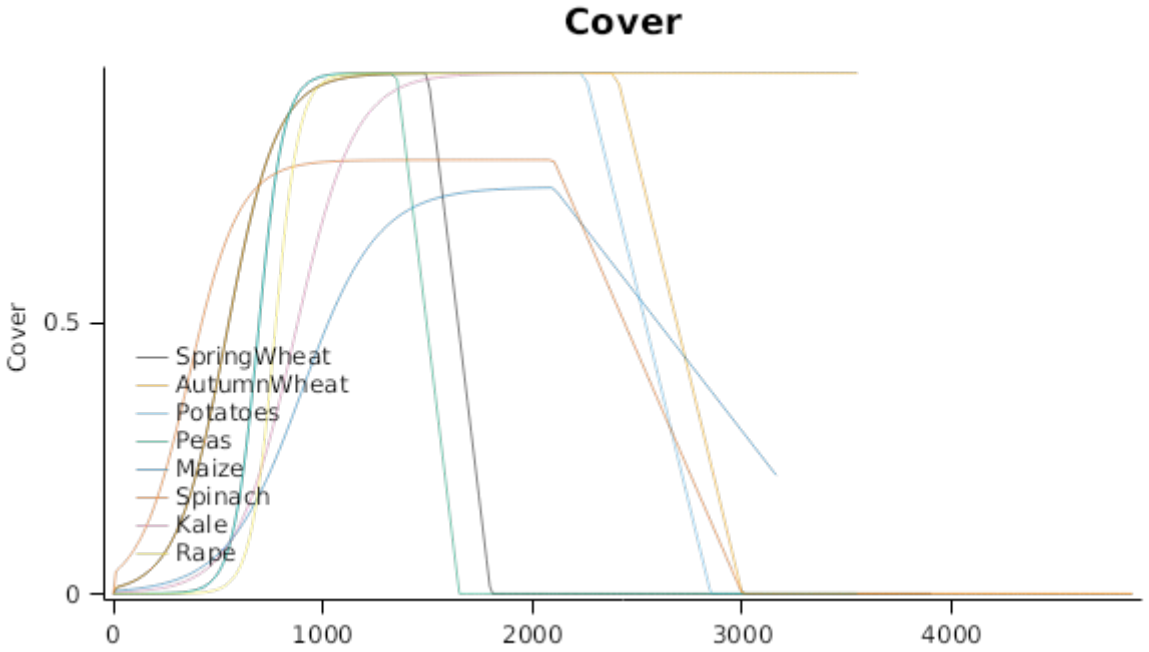


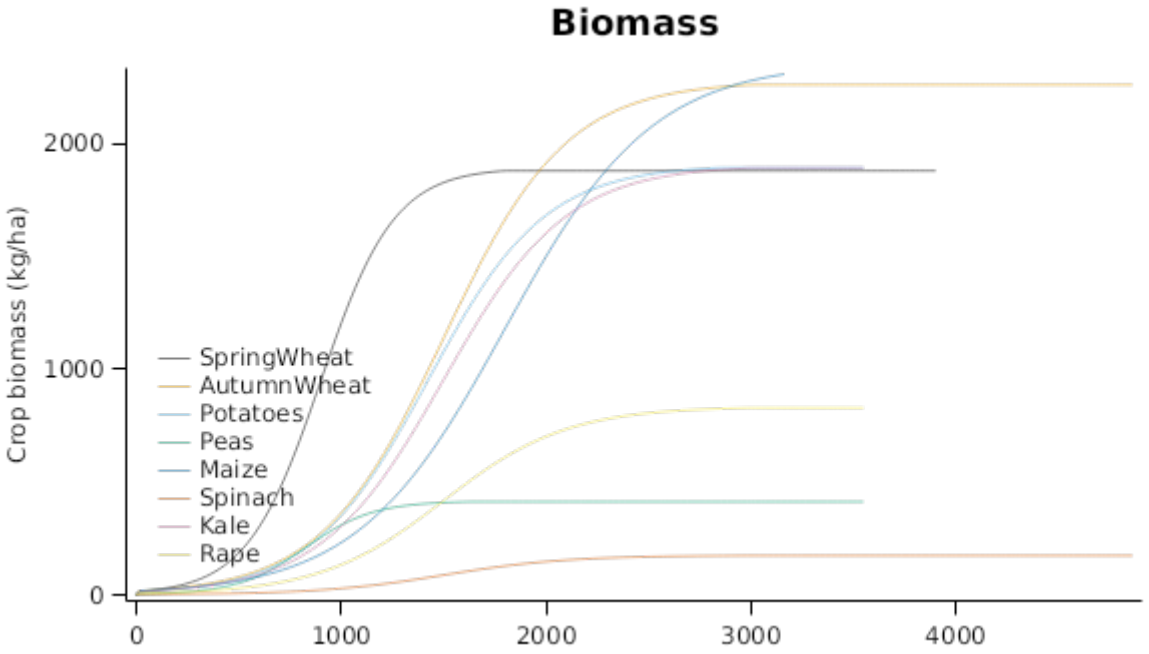


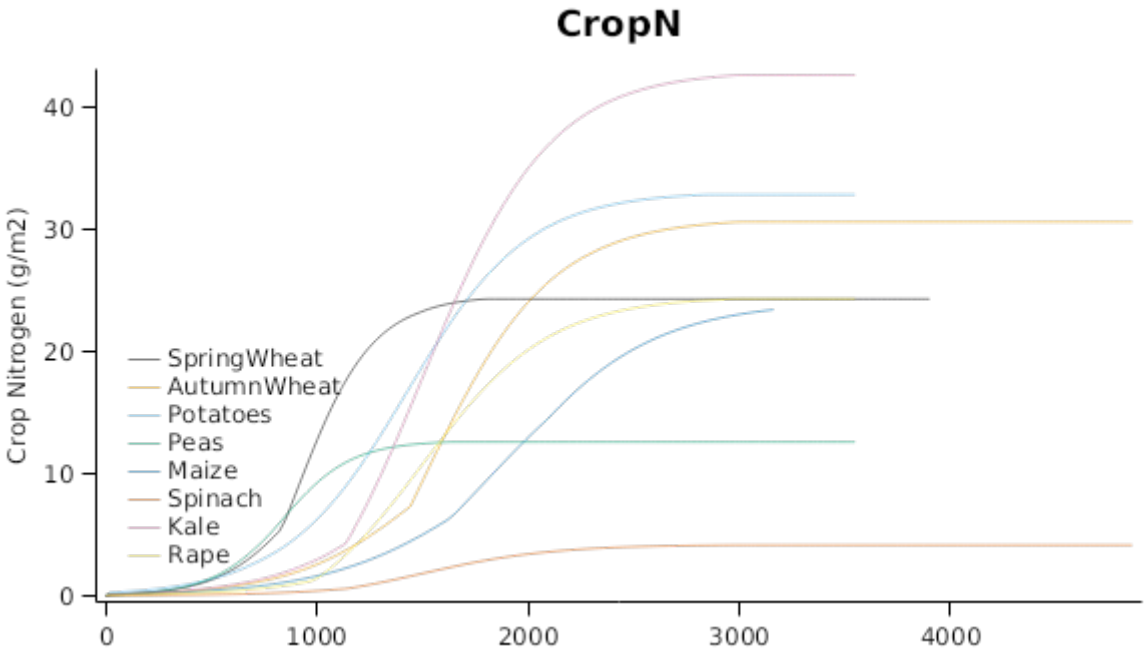
4 Crop Comparisions

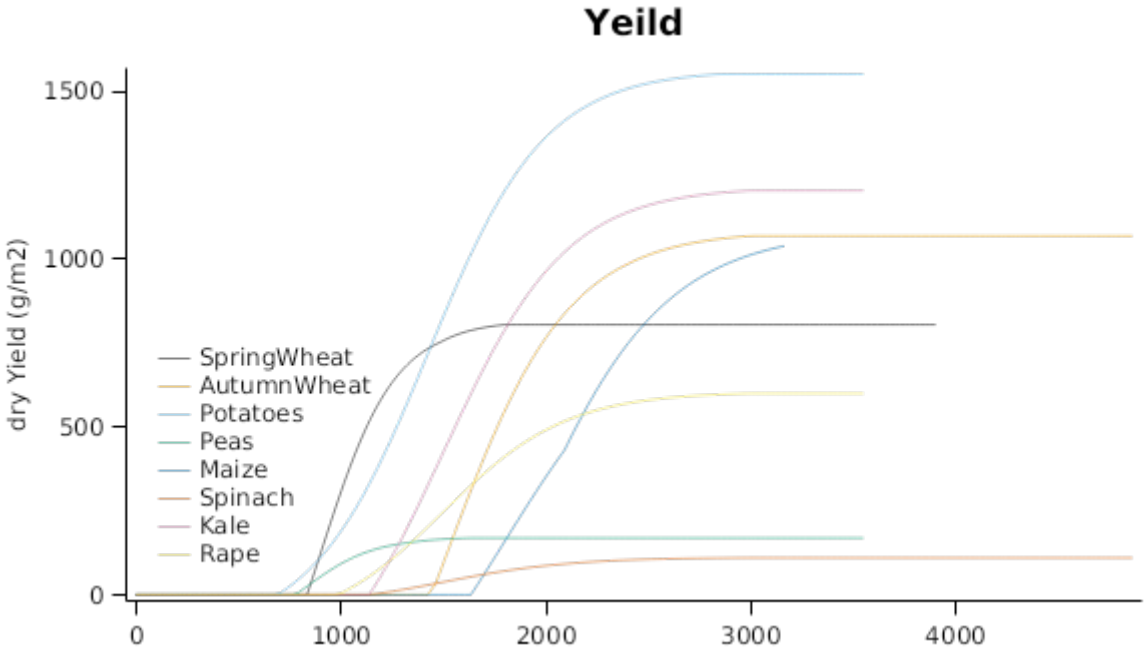
This test simply simulates a range of different SCRUM crop types to show how they differ in their canopy and biomass accumulation patterns. The 5 graphs demonstrate the differences in:

- The speed at which cover is attained
- The maximum cover that is achieved
- The speed and which cover is senesced again
- The speed and extent of biomass and N accumulation
- The timing and extent of dry and fresh yield productin These graphs are intended to demonstrate how SCRUM represents approximate differences in differnt crops types with simple yet realistic temporal patterns


Cover
Cover
0.5
0
SpringWheat
AutumnWheat
Potatoes
Peas
Maize
Spinach
Kale
Rape
0
1000
2000
3000
4000


Biomass
Crop biomass (kg/ha)
2000
1000
0
SpringWheat
AutumnWheat
Potatoes
Peas
Maize
Spinach
Kale
Rape
0
1000
2000
3000
4000

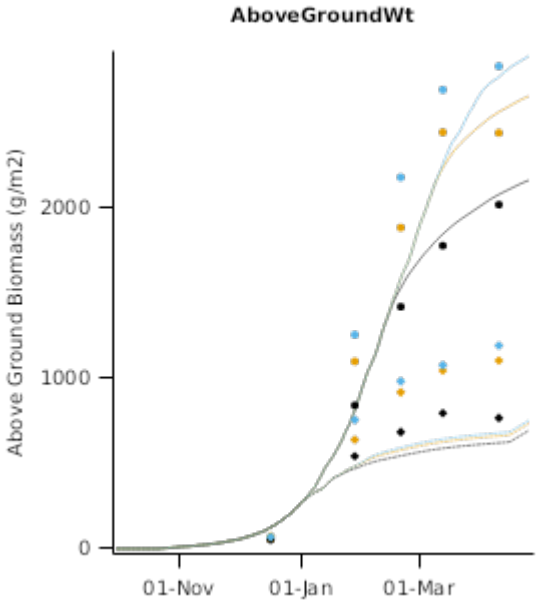

CropN
Crop Nitrogen (g/m2)
0
10
20
30
40
0
1000
2000
3000
4000
SpringWheat
AutumnWheat
Potatoes
Peas
Maize
Spinach
Kale
Rape

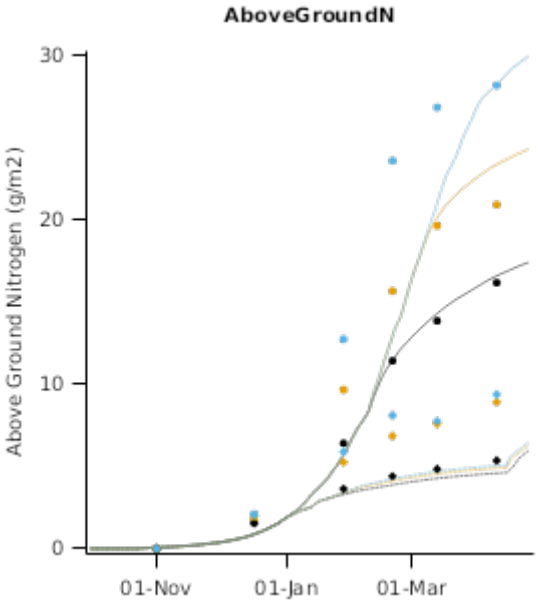

Yeild
dry Yield (g/m2)
0
500
1000
1500
0
1000
2000
3000
4000
SpringWheat
AutumnWheat
Potatoes
Peas
Maize
Spinach
Kale
Rape

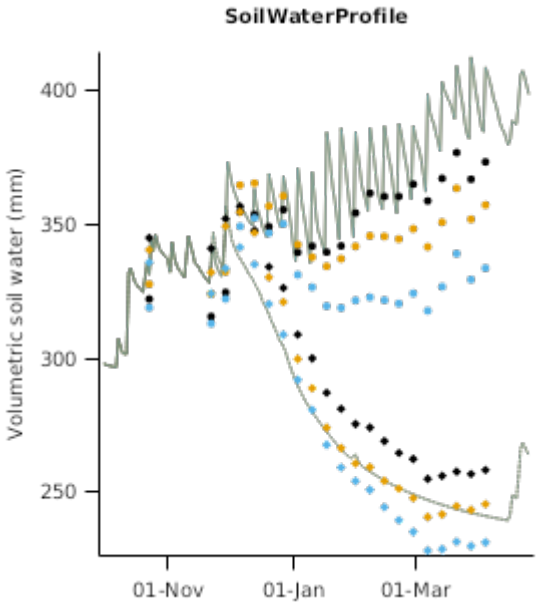
5 Lincoln2012

Testing of SCRUM under New Zealand conditions was undertaken using the data Maize data of Teixeira et al (2014). This dataset includes the impact of three N (0 to 250 kg/ha N) and two water regimes (dryland and fully irrigated) using a rain-shelter structure. Observations include biomass and nitrogen accumulation, soil water contents. Total biomass ranged from 8000 kg/ha for dryland nil N crops to up to 28000kg/ha for fully irrigated and N fertilised crops. Dryland crops recovered 25 percent less N from applied fertilizer than irrigated crops. The expected yields were set to 18 t/ha (the yield achieved in the fully irrigation Med N plots) for all treatments and the simple N and water responses of SCRUM were allowed to predict treatment effects. The three graphs below show that SCRUM gave adequate estimations of biomass and N accumulations in respone to irrigation and fertiliser treatments and adequate estimations of soil water content. This suggests Scum is suitable for its intended purpose of providing realistic N and water uptake patterns for N and water balance studies.

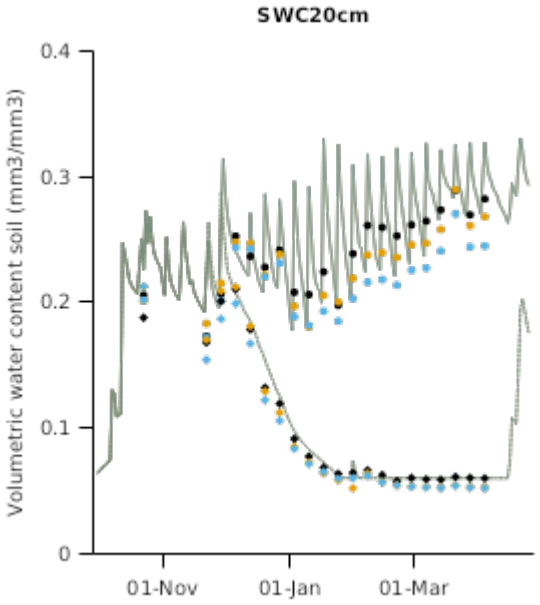
5.1 Graphs

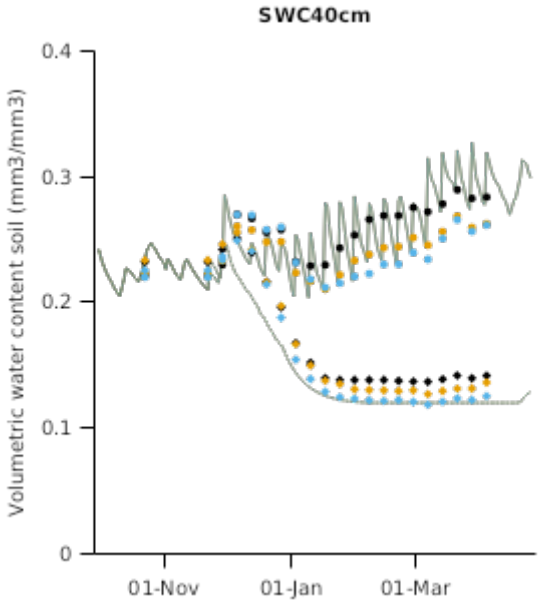


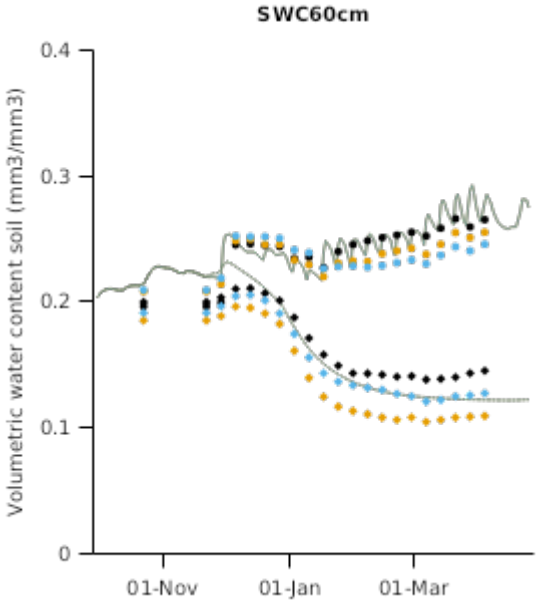


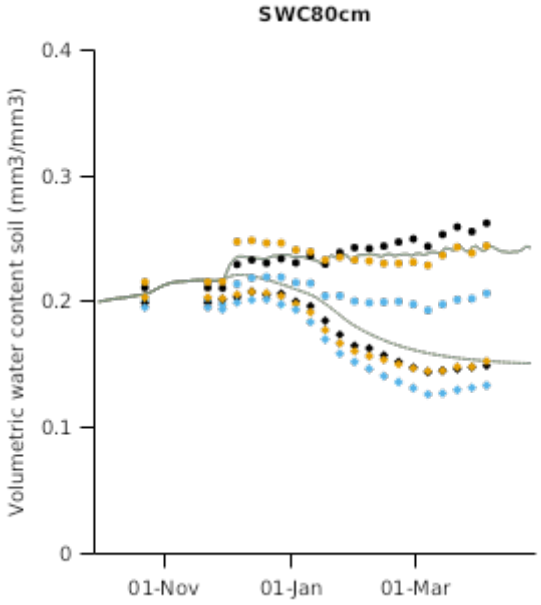


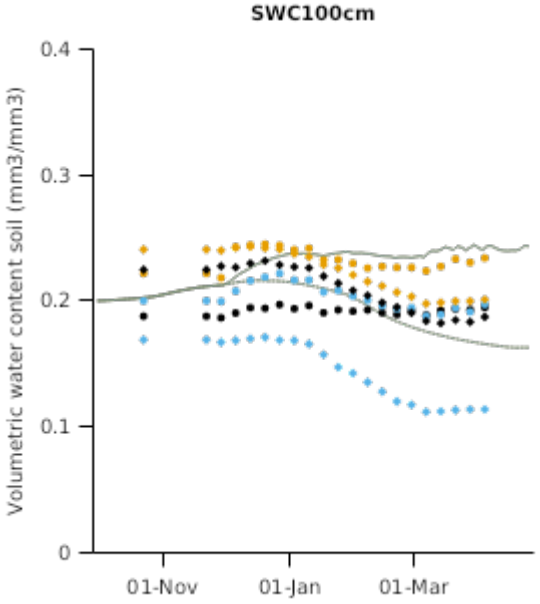
5.1.1 SWCLayers

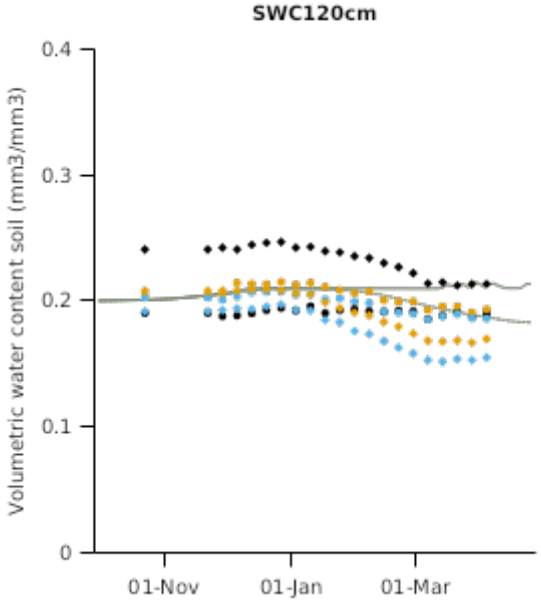

SWC20cm
Volumetric water content soil (mm3/mm3)
0.4
0.3
0.2
0.1
0
01-Nov
01-Jan
01-Mar

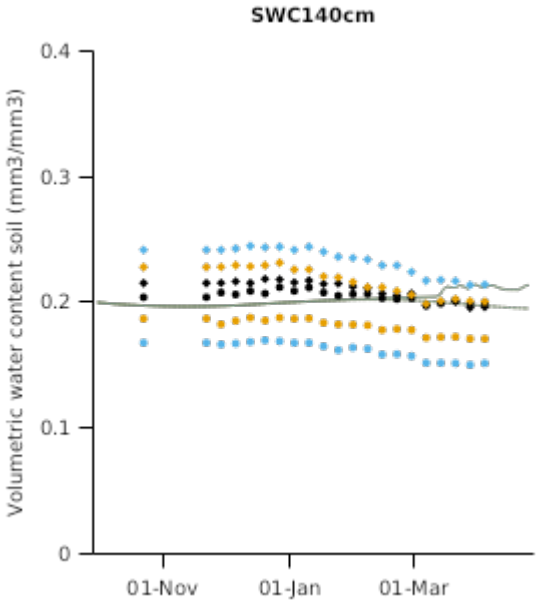

SWC40cm
Volumetric water content soil (mm3/mm3)
0.4
0.3
0.2
0.1
0
01-Nov
01-Jan
01-Mar

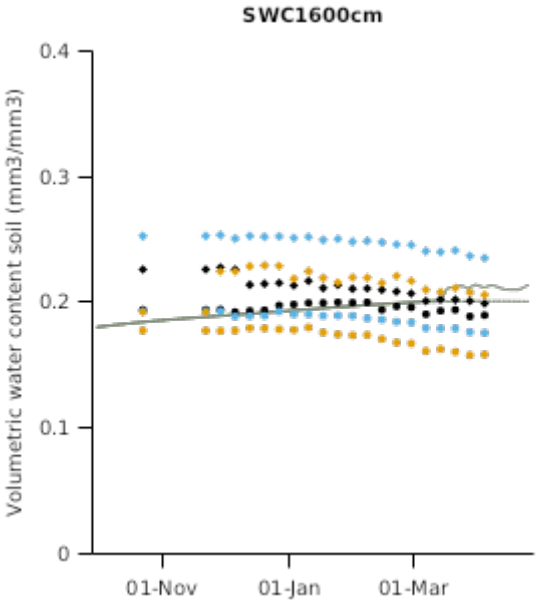

SWC60cm
Volumetric water content soil (mm3/mm3)
0.4
0.3
0.2
0.1
0
01-Nov
01-Jan
01-Mar


SWC80cm
Volumetric water content soil (mm3/mm3)
0.4
0.3
0.2
0.1
0
01-Nov
01-Jan
01-Mar

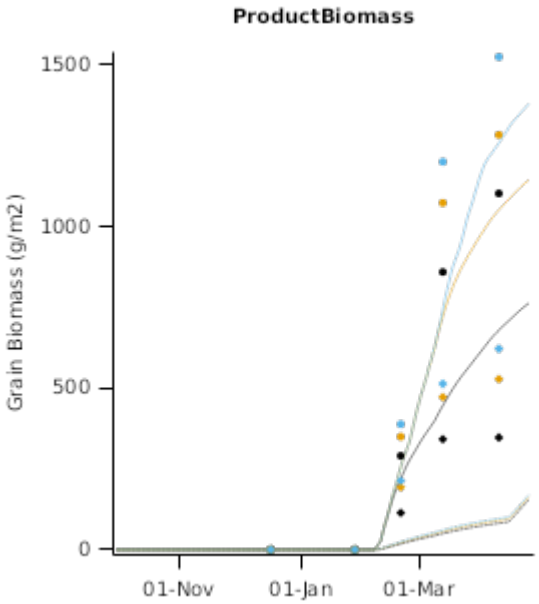

SWC100cm
Volumetric water content soil (mm3/mm3)
0.4
0.3
0.2
0.1
0
01-Nov
01-Jan
01-Mar

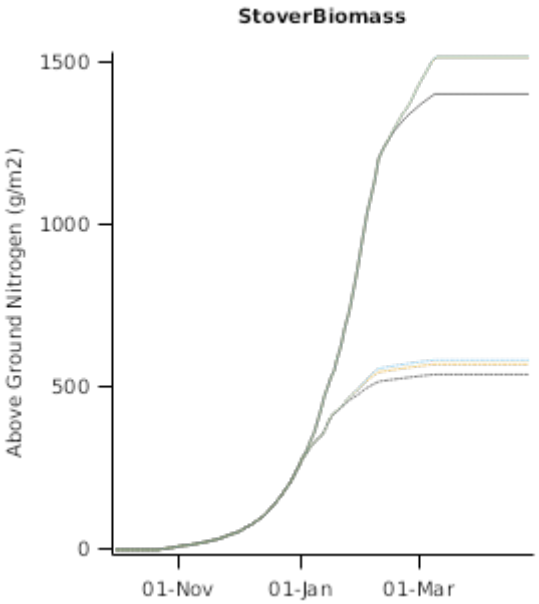

SWC120cm
Volumetric water content soil (mm3/mm3)
0.4
0.3
0.2
0.1
0
01-Nov
01-Jan
01-Mar

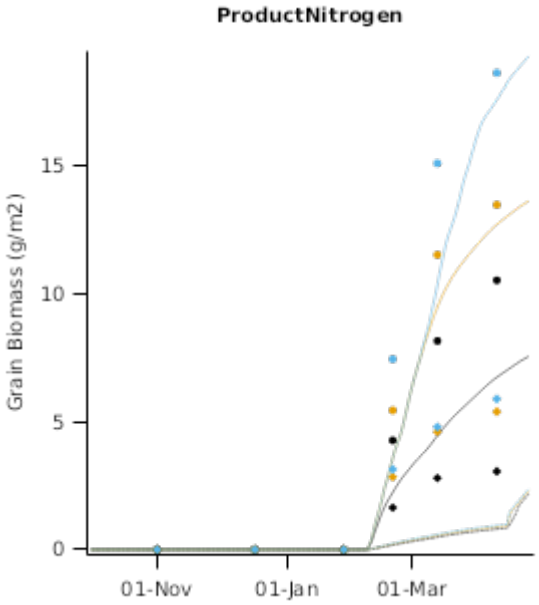


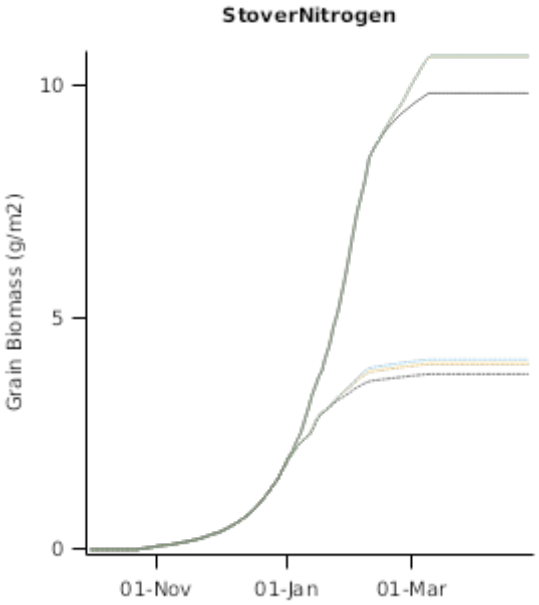


5.1.2 OrganBiomass

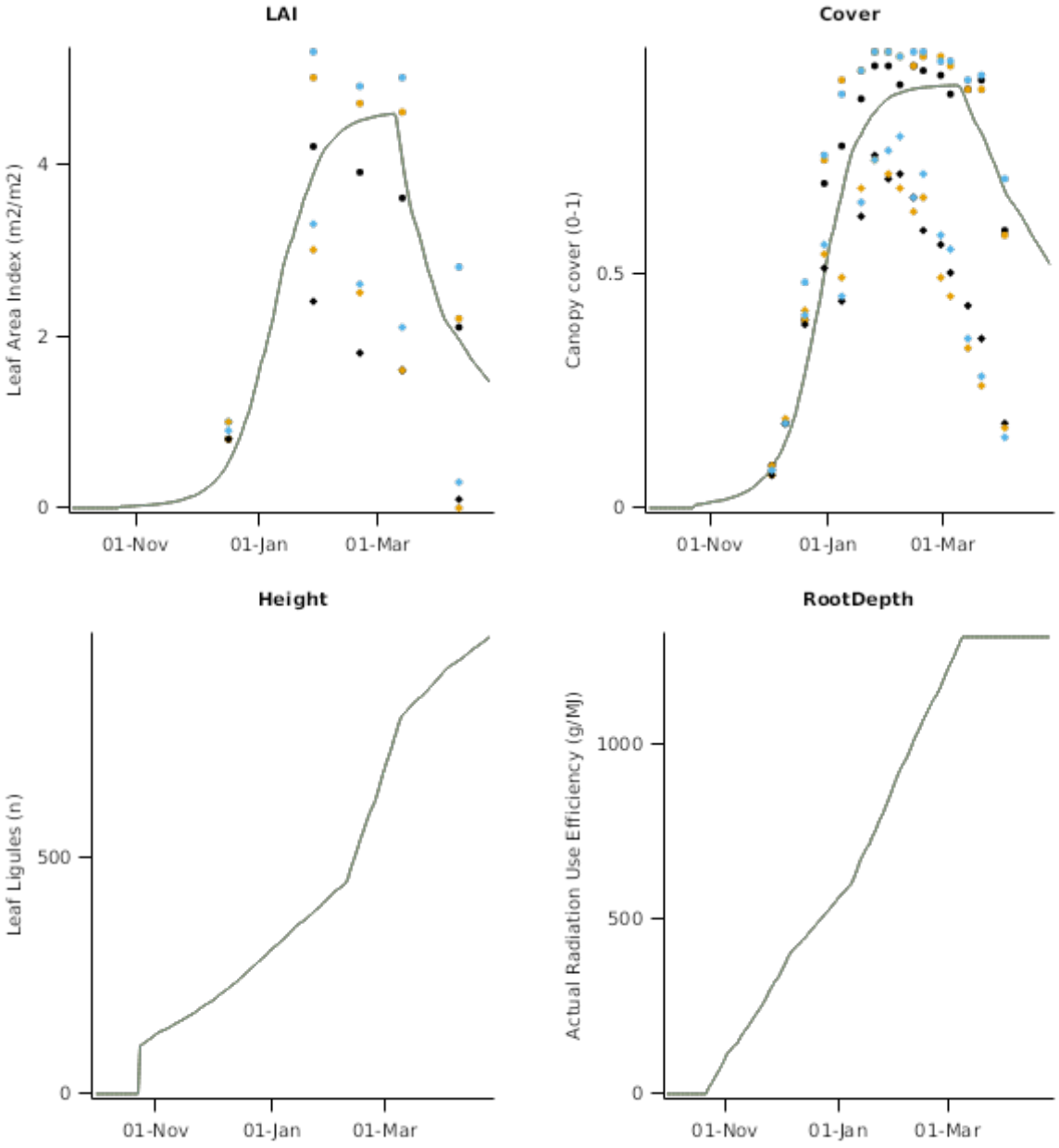




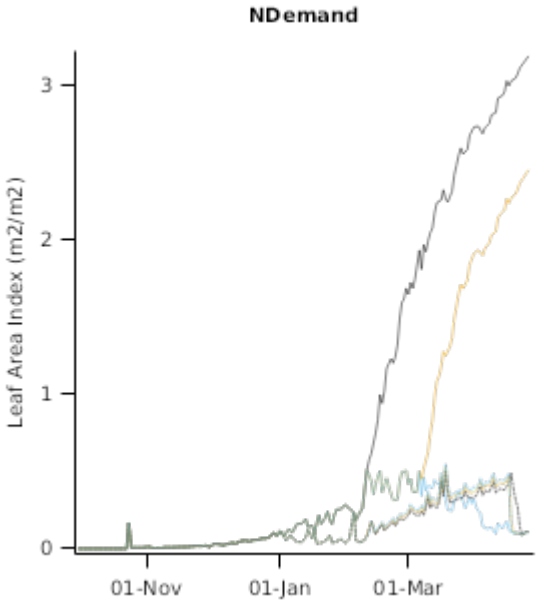


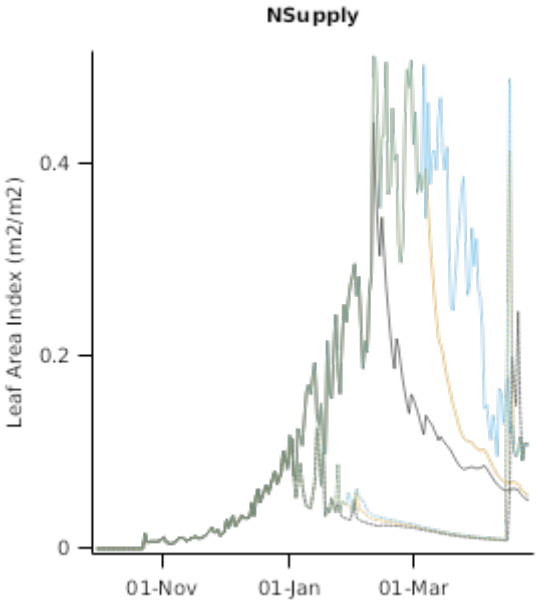


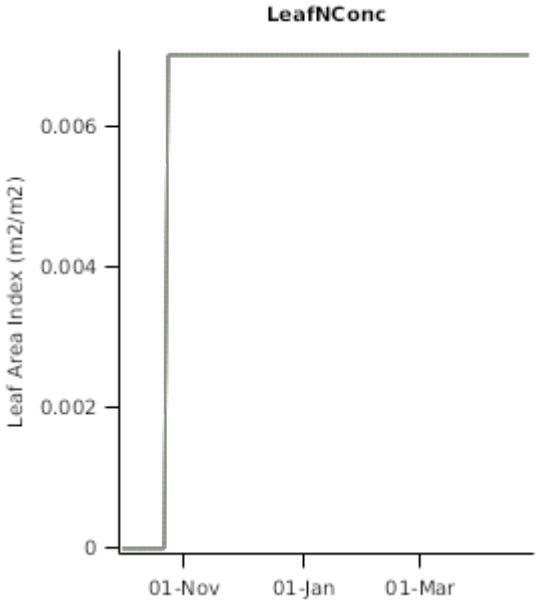
5.1.3 Canopy

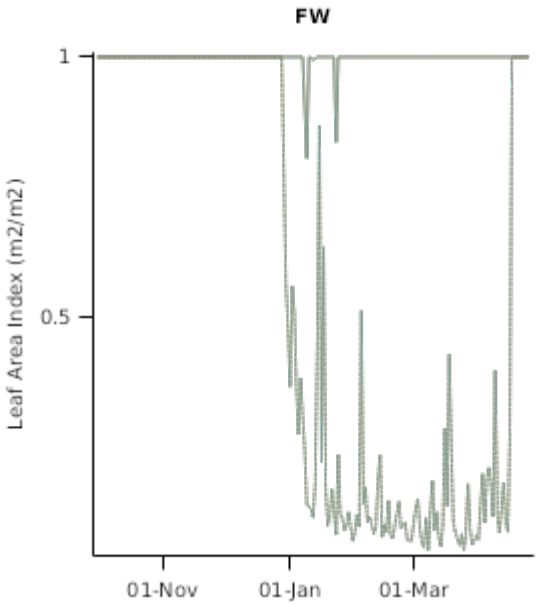


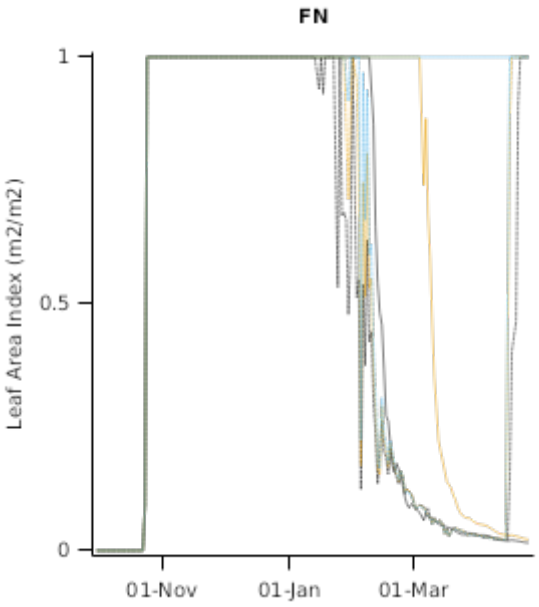
5.1.4 Sensibility









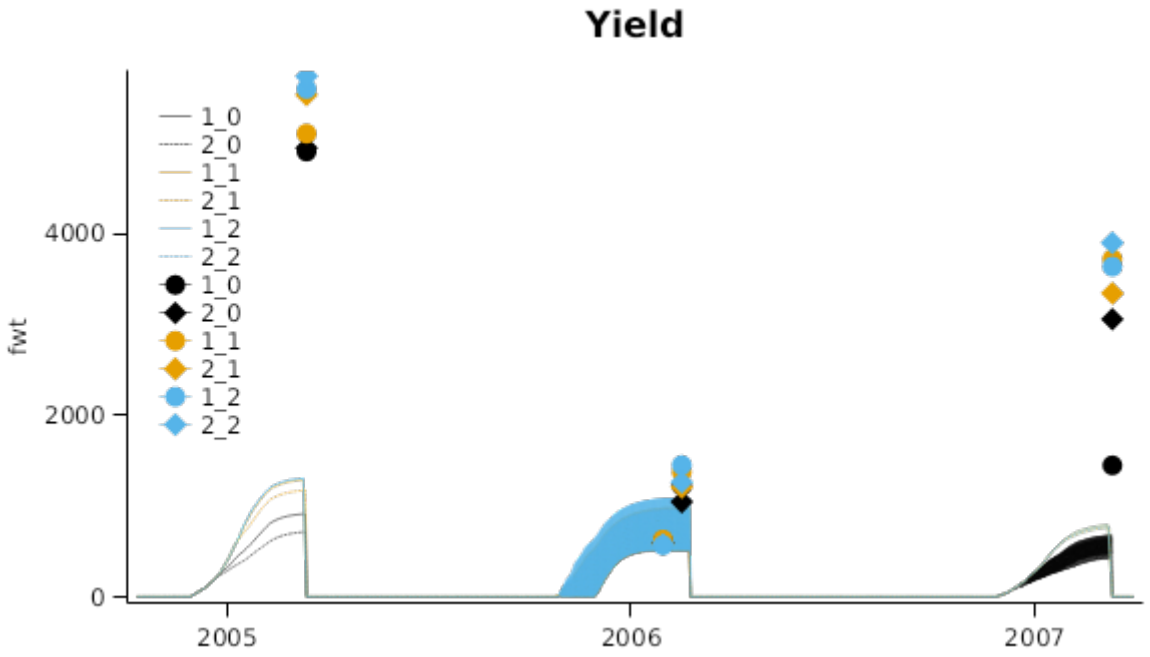


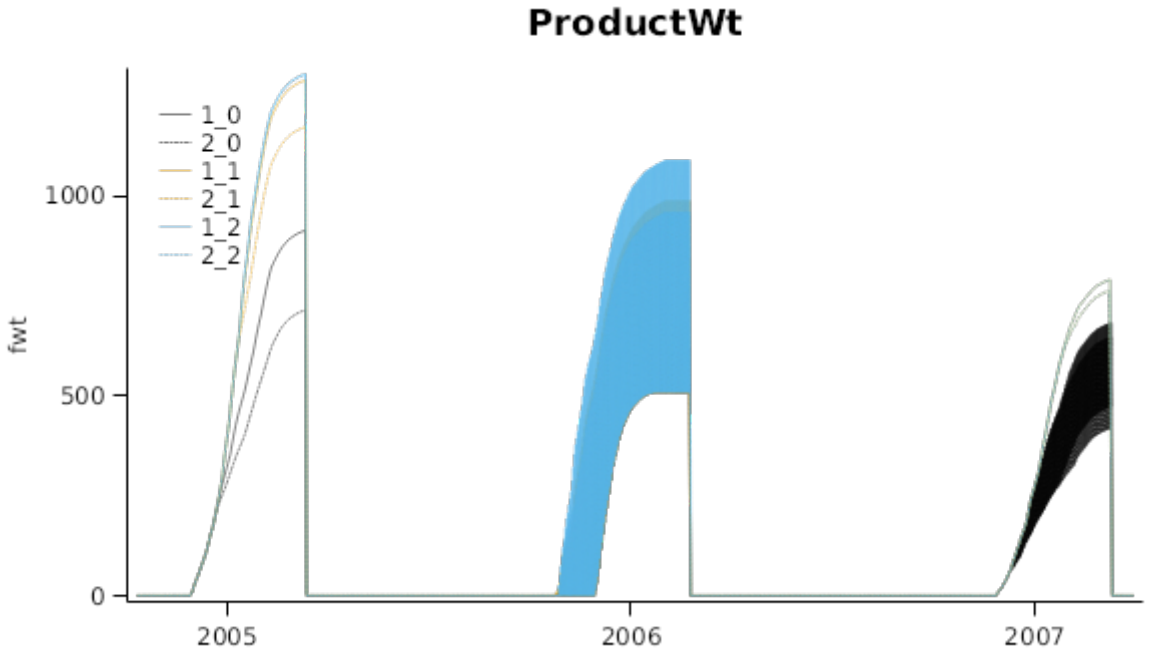
6 ABlock

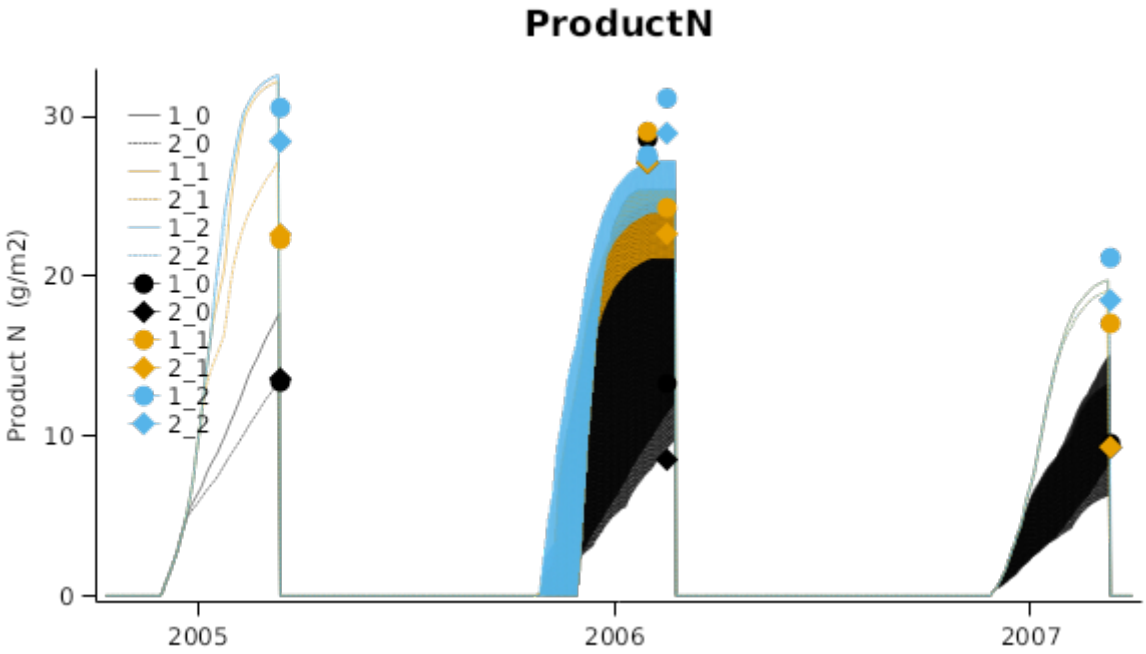
In this test we use SCRUM to represent differnt crops in two different rotation treatments (Potatoes -> Wheat -> Potatoes and Potatoes -> Peas -> Potatoes) with two irrigation (W1 and W2) and three N fertiliser treatments (N0, N1 and N2). These rotations ran over three years and were conducted to provide data for testing N leaching predictions of different

models. SCRUM yields were set to the High N full irrigation treatment values for each crop and SCRUMs N and water responses were allowed to predict any differences in crop N uptake. It is importnat to note that the soilN organic matter degridation coefficients were set to custom (non-release) values as this has been necessary to predict accurate N mineralisation values in new zealand arable soils.

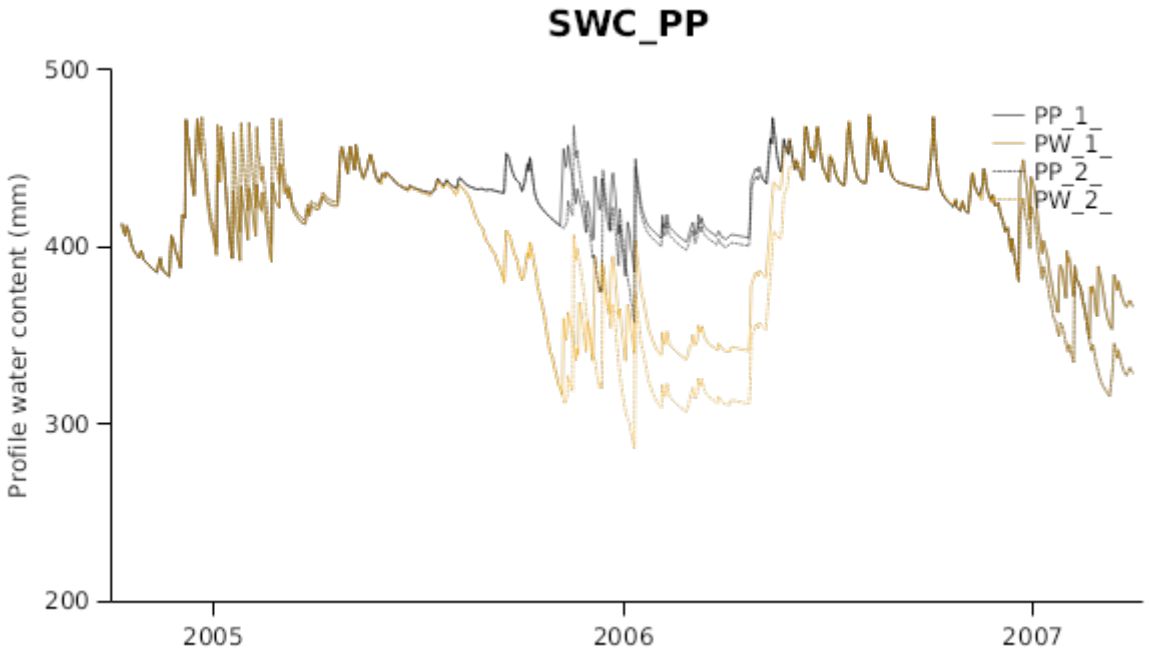
SCRUM gave reasionable predictions of Product N removals, soil water contents and accumulated leaching from each crop treatment. This provides further support that SCRUM is adequate for the task of providing realistic N and Water uptakes for the purpose of N and water balance studies.

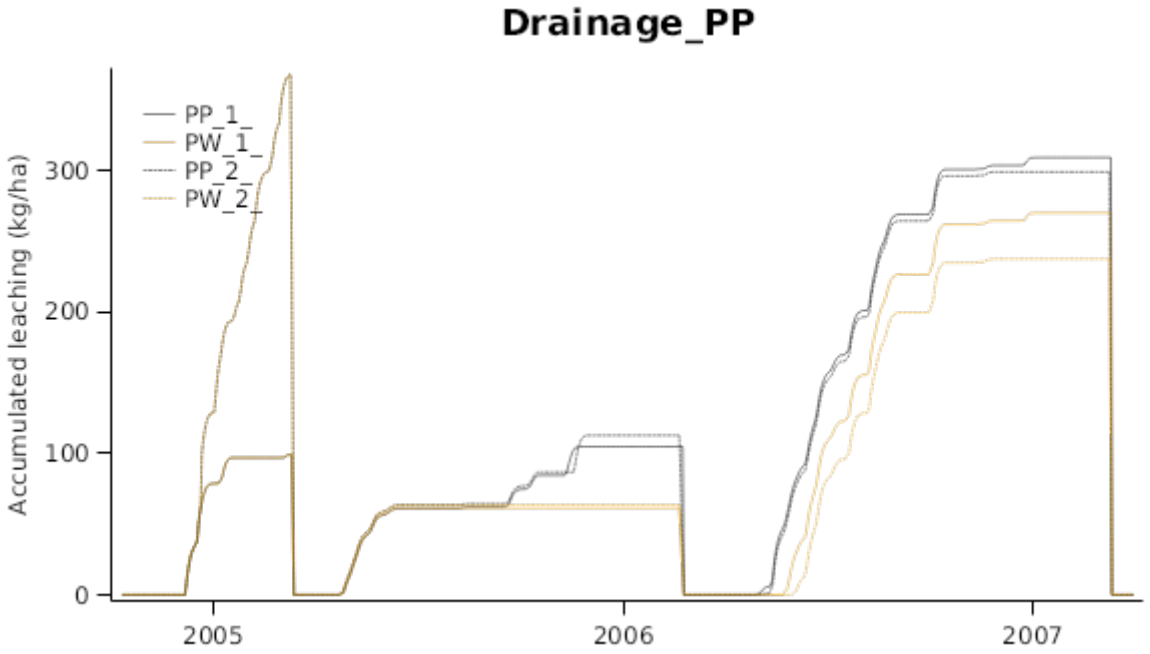


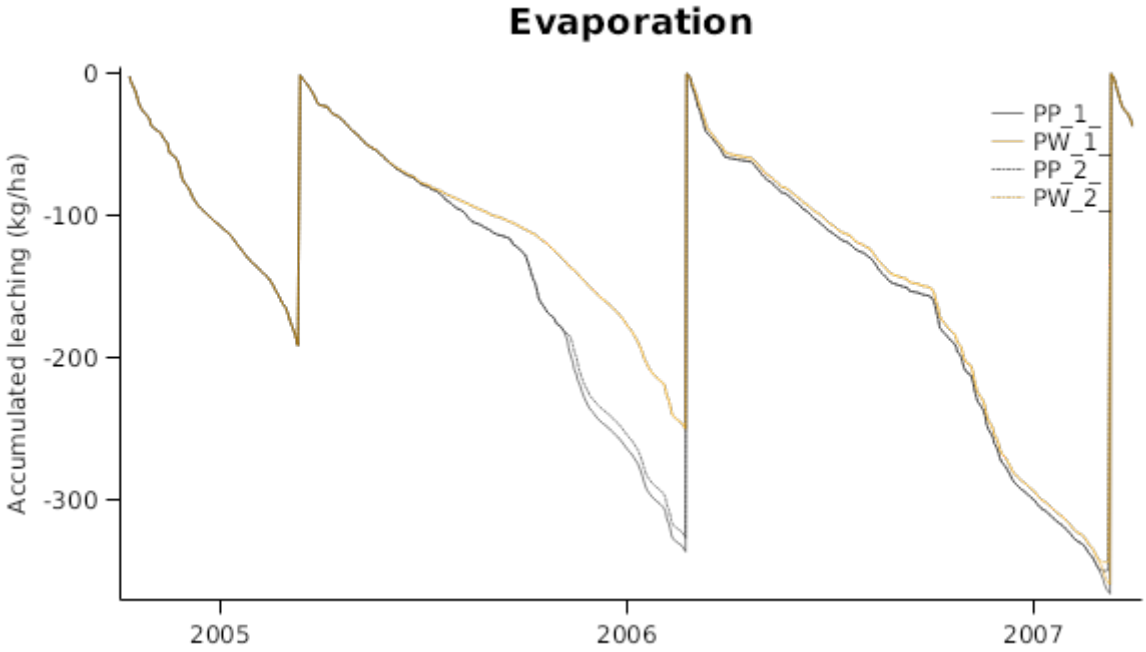


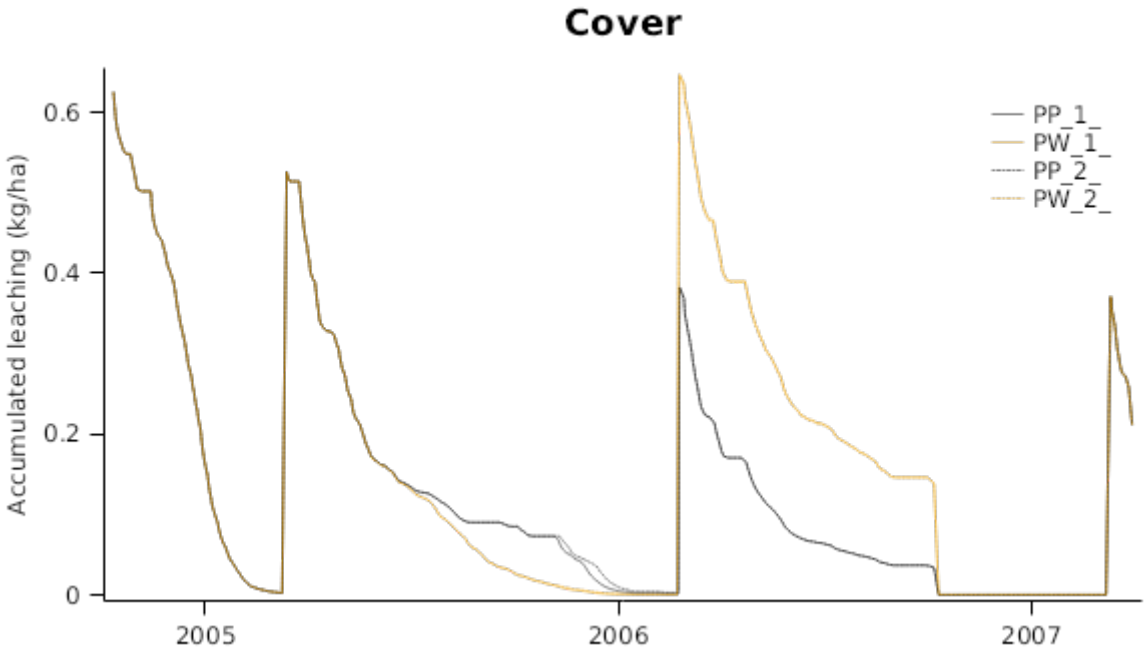


SurfaceResidueWt

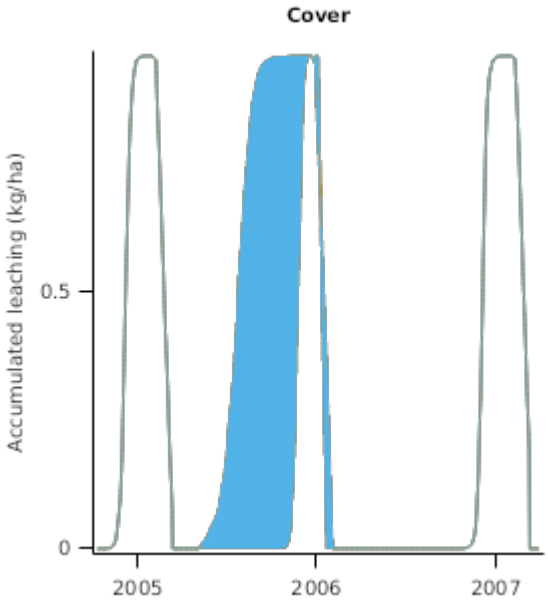

SWC_PP
Profile water content (mm)
500
400
300
200
2005
2006
2007
PP_1_
PW_1_
PP_2_
PW_2_

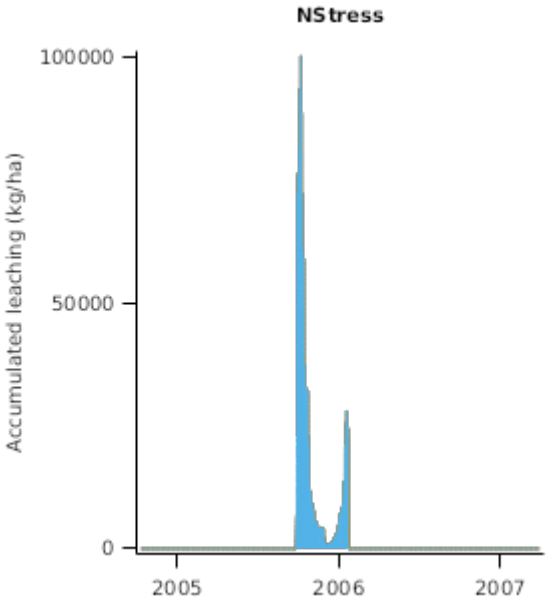

Drainage_PP
Accumulated leaching (kg/ha)
300
200
100
0
2005
2006
2007
PP_1_
PW_1_
PP_2_
PW_2_

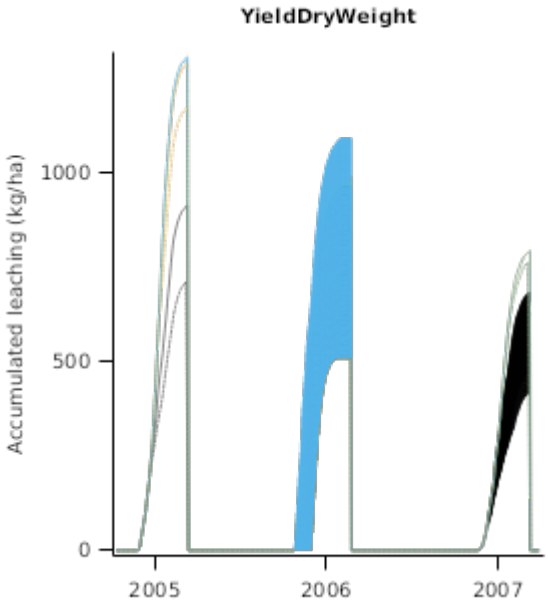


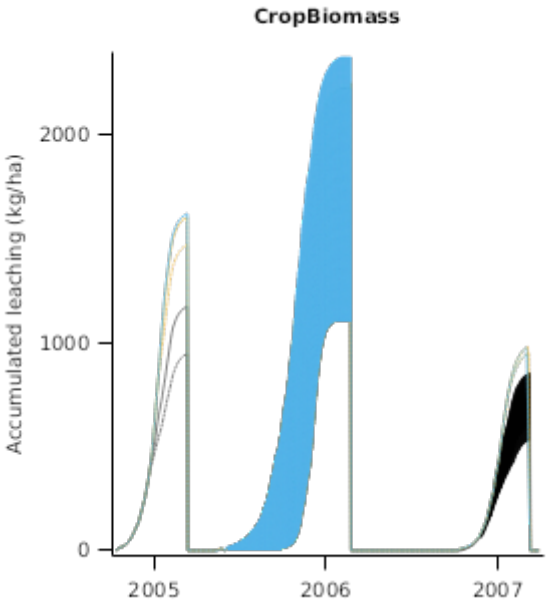


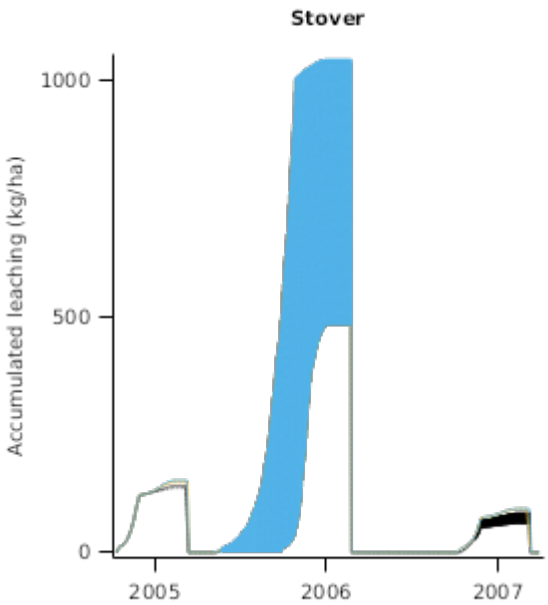
6.1 CheckGraphs


Cover
Accumulated leaching (kg/ha)
0.5
0
2005
2006
2007

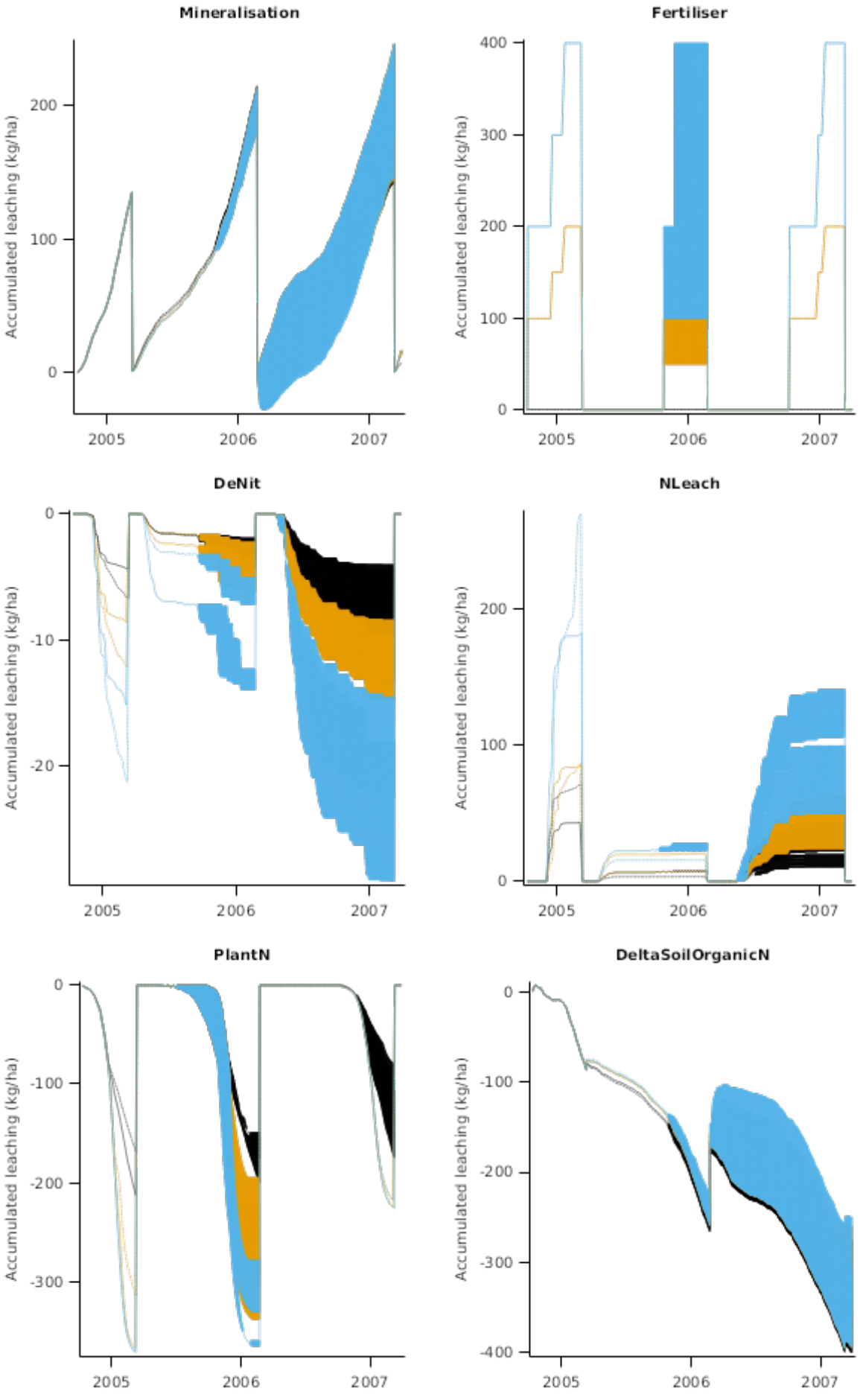

NStress
Accumulated leaching (kg/ha)
100000
50000
0
2005
2006
2007

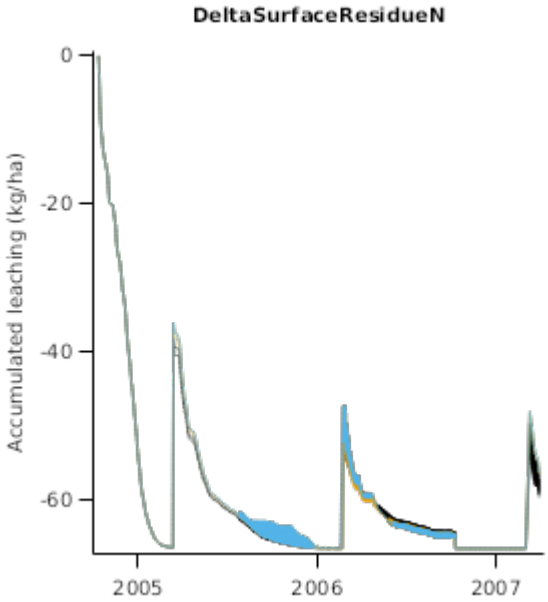

YieldDryWeight
Accumulated leaching (kg/ha)
1000
500
0
2005
2006
2007


CropBiomass
Accumulated leaching (kg/ha)
2000
1000
0
2005
2006
2007

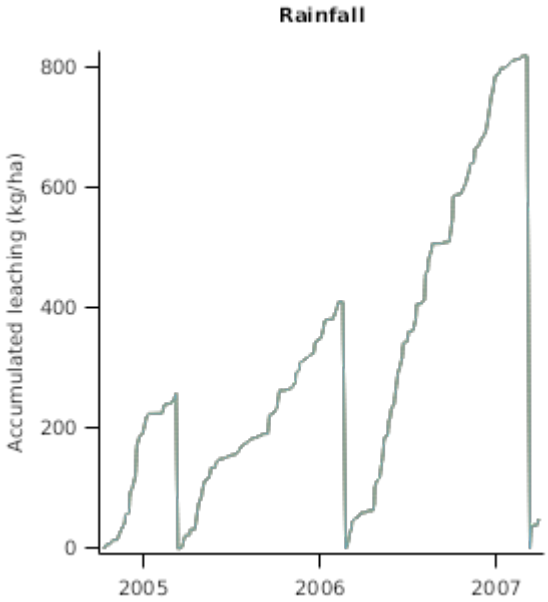

Stover
Accumulated leaching (kg/ha)
1000
500
0
2005
2006
2007

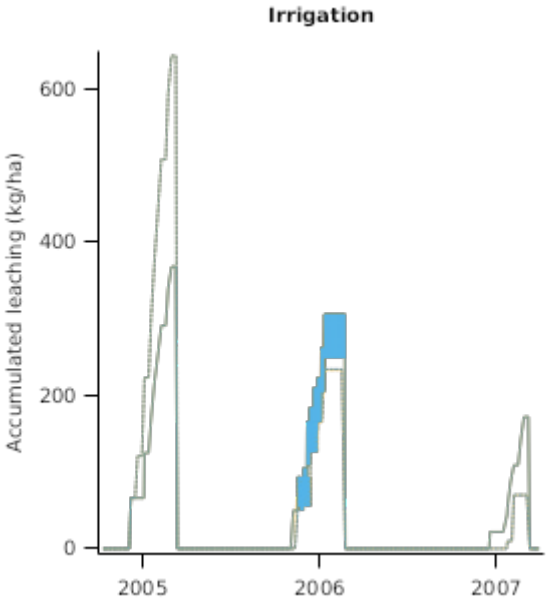
6.2 NBalance

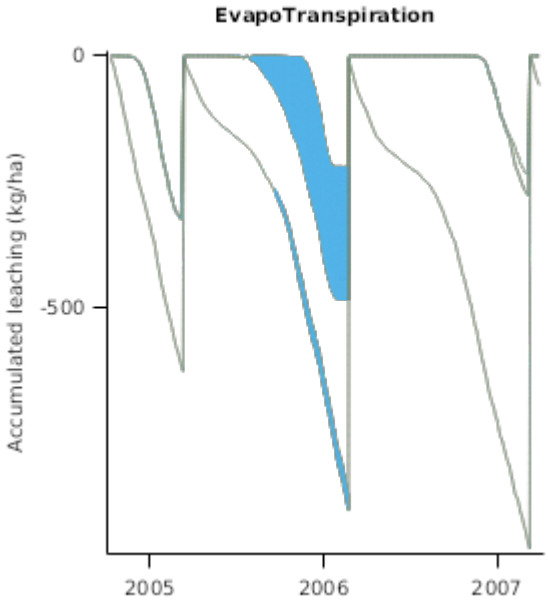

Mineralisation
Fertiliser
DeNit
NLeach
PlantN
DeltaSoilOrganicN
Accumulated leaching (kg/ha)
2005
2006
2007

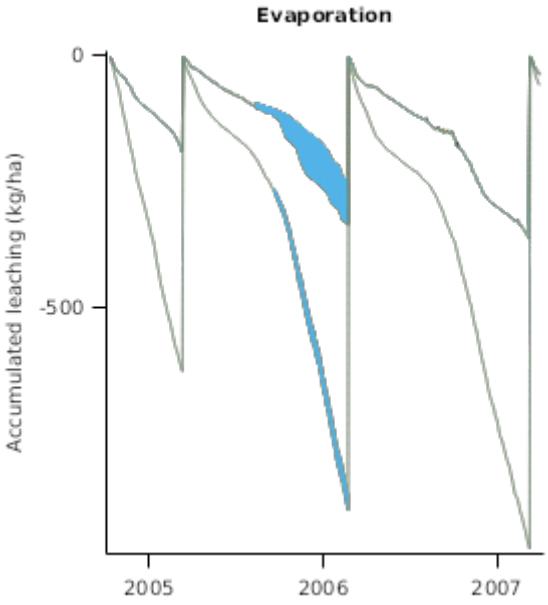


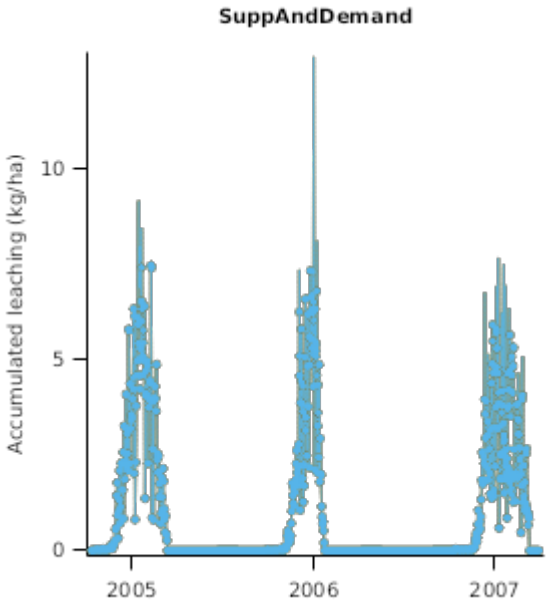
6.3 WaterBalance

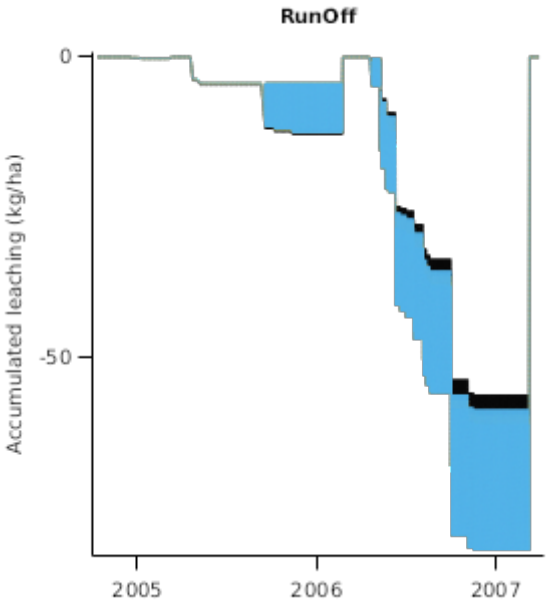


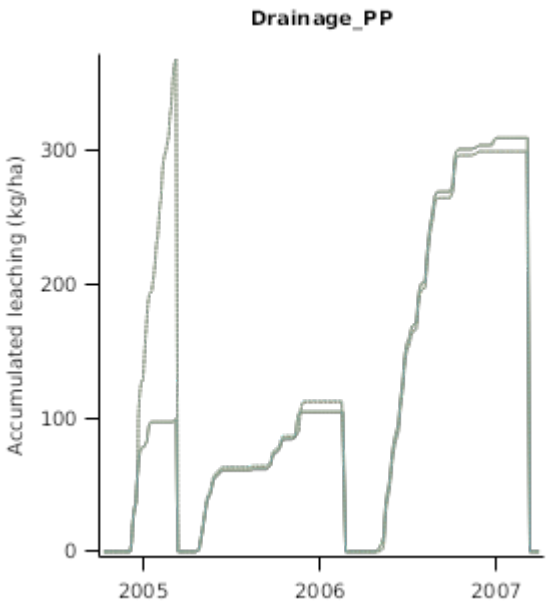


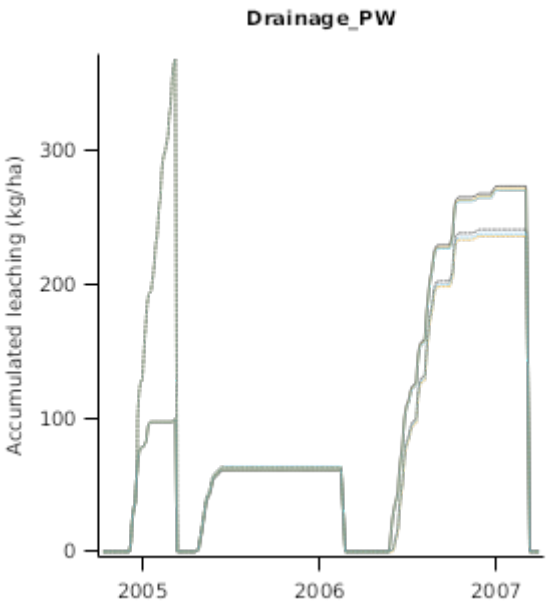

EvapoTranspiration
Accumulated leaching (kg/ha)
0
-500
2005
2006
2007


Evaporation
Accumulated leaching (kg/ha)
0
-500
2005
2006
2007

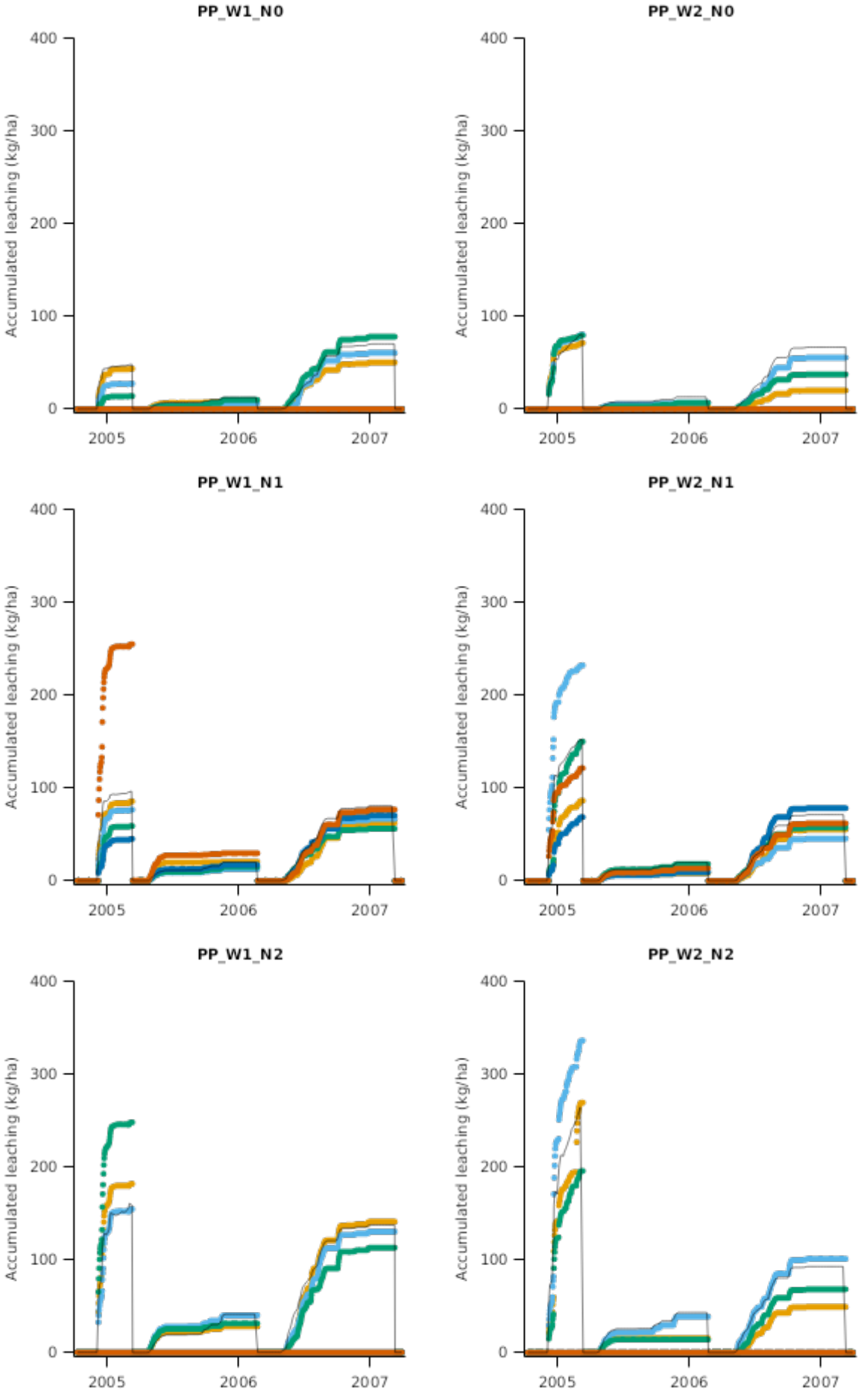

SuppAndDemand
Accumulated leaching (kg/ha)
10
5
0
2005
2006
2007

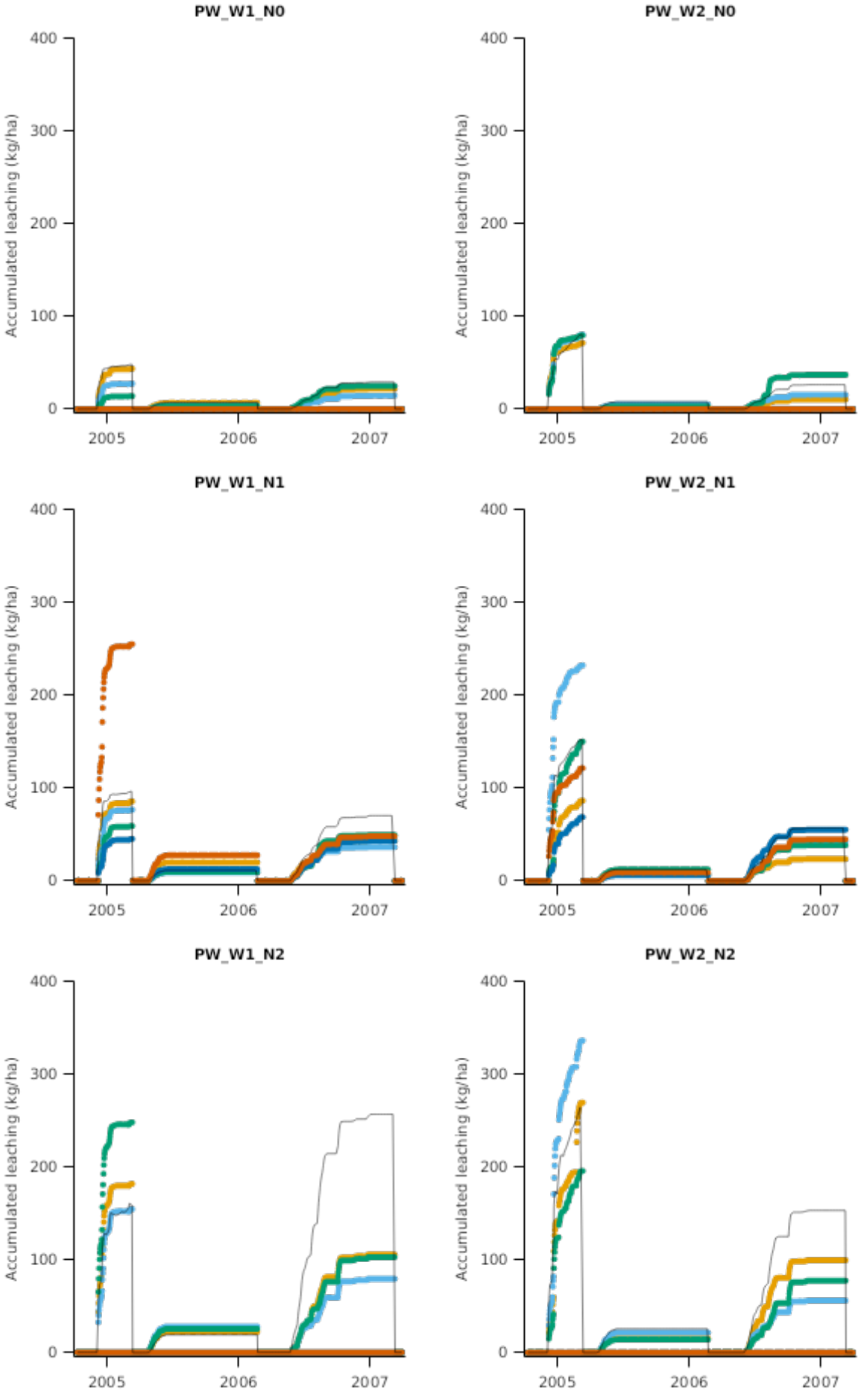

RunOff
Accumulated leaching (kg/ha)
0
-50
2005
2006
2007


Drainage_PP
Accumulated leaching (kg/ha)
300
200
100
0
2005
2006
2007

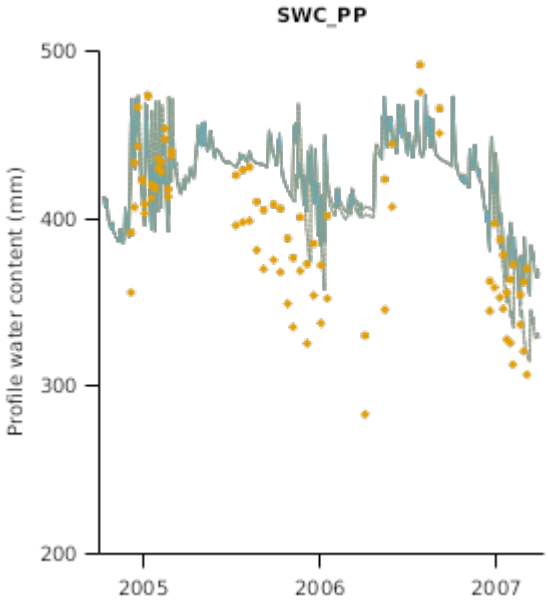

Drainage_PW
Accumulated leaching (kg/ha)
300
200
100
0
2005
2006
2007

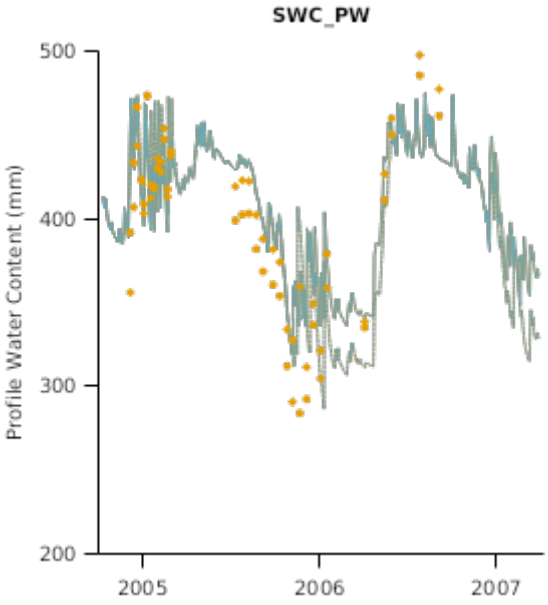
6.4 Leaching


PP_W1_N0
PP_W2_N0
PP_W1_N1
PP_W2_N1
PP_W1_N2
PP_W2_N2
Accumulated leaching (kg/ha)
0
100
200
300
400
2005
2006
2007

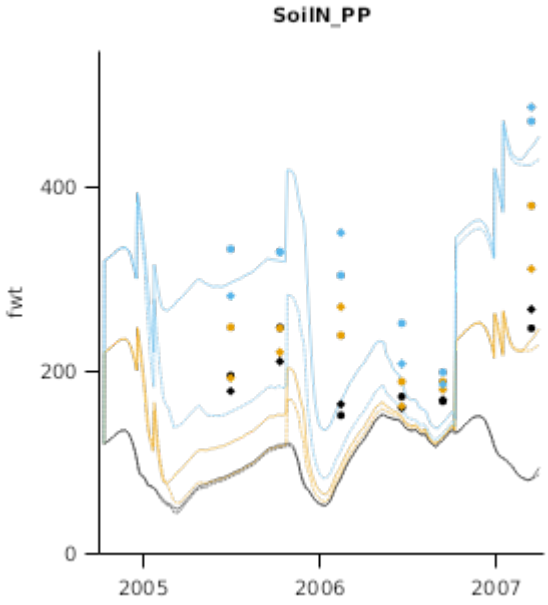

PW_W1_N0
PW_W2_N0
PW_W1_N1
PW_W2_N1
PW_W1_N2
PW_W2_N2
Accumulated leaching (kg/ha)
0
100
200
300
400
2005
2006
2007

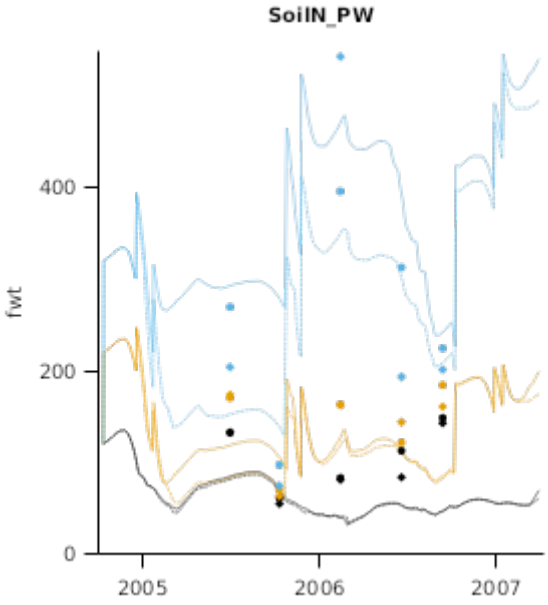
6.5 SWC





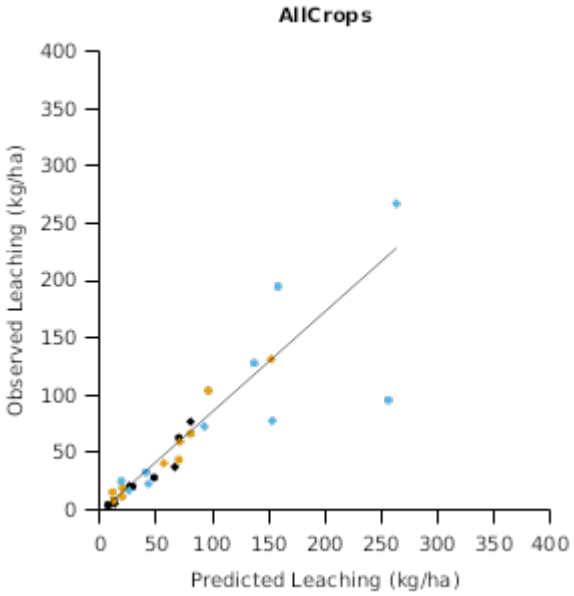
6.6 SoilNitrogen

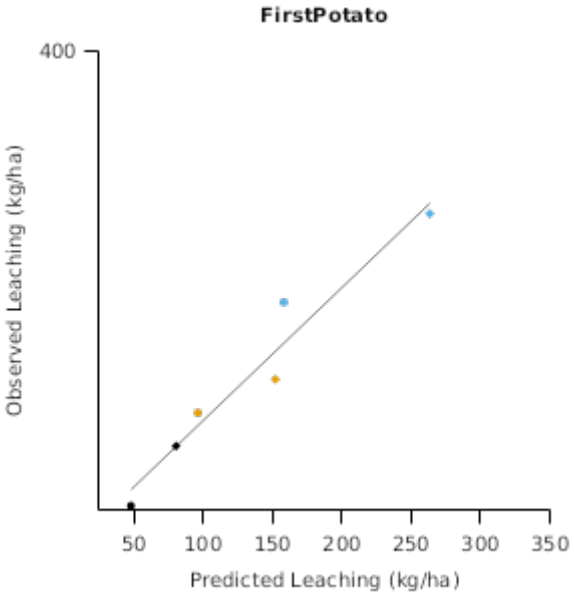


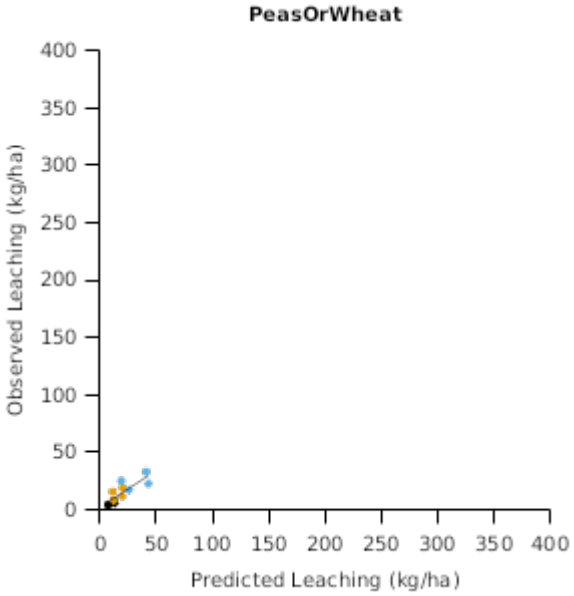


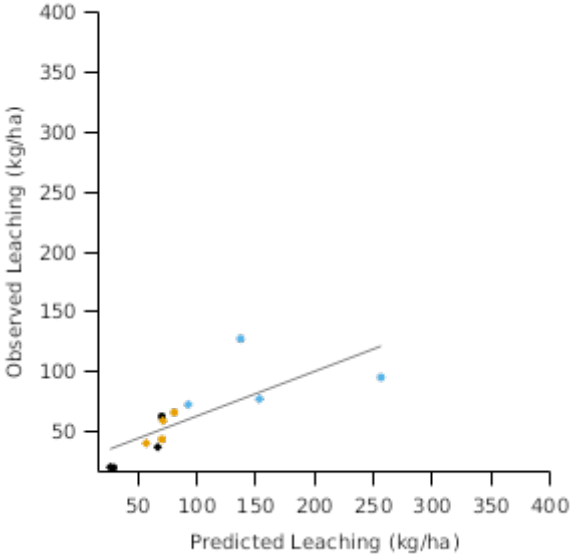
6.7 LeachingObsPre

Predictions working well for all but the high N treatment in the final wheat crop following the potato crop. I suspect the model is under predicting Denitrification here









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