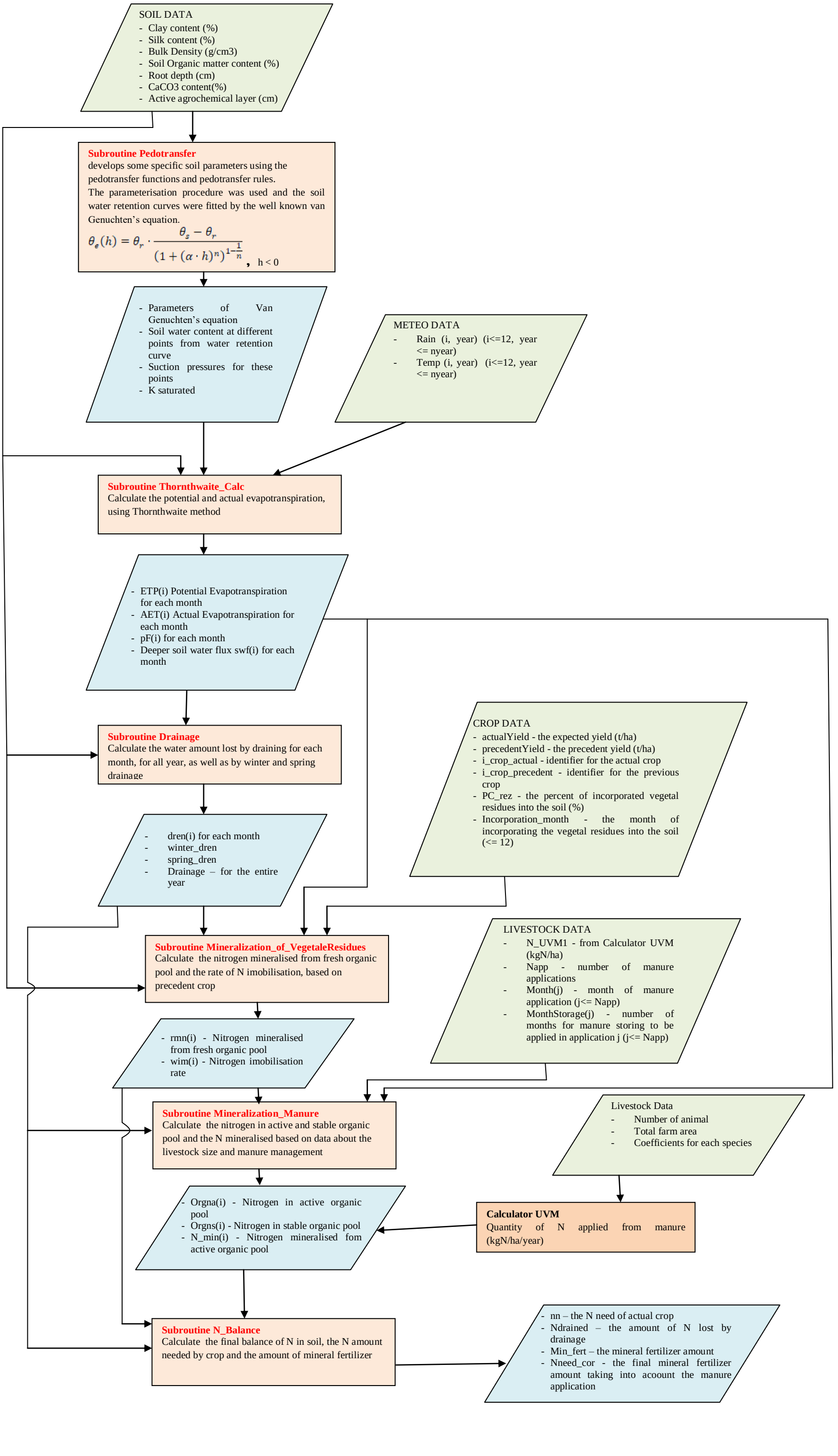
SOIL DATA
- Clay content (%)
- Silk content (%)
- Bulk Density (g/cm3)
- Soil Organic matter content (%)
- Root depth (cm)
- CaCO3 content(%)
- Active agrochemical layer (cm)
Subroutine Pedotransfer
develops some specific soil parameters using the pedotransfer functions and pedotransfer rules.
The parameterisation procedure was used and the soil water retention curves were fitted by the well known van Genuchten's equation.
$\theta_e(h) = \theta_r \cdot \frac{\theta_s - \theta_r}{(1 + (\alpha \cdot h)^n)^{1-\frac{1}{n}}}$, h < 0
- Parameters of Van Genuchten's equation
- Soil water content at different points from water retention curve
- Suction pressures for these points
- K saturated
METEO DATA
- Rain (i, year) (i<=12, year <= nyear)
- Temp (i, year) (i<=12, year <= nyear)
Subroutine Thornthwaite_Calc
Calculate the potential and actual evapotranspiration, using Thornthwaite method
- ETP(i) Potential Evapotranspiration for each month
- AET(i) Actual Evapotranspiration for each month
- pF(i) for each month
- Deeper soil water flux swf(i) for each month
Subroutine Drainage
Calculate the water amount lost by draining for each month, for all year, as well as by winter and spring drainage
- dren(i) for each month
- winter_dren
- spring_dren
- Drainage – for the entire year
CROP DATA
- actualYield - the expected yield (t/ha)
- precedentYield - the precedent yield (t/ha)
- i_crop_actual - identifier for the actual crop
- i_crop_precedent - identifier for the previous crop
- PC_rez - the percent of incorporated vegetal residues into the soil (%)
- Incorporation_month - the month of incorporating the vegetal residues into the soil (<= 12)
Subroutine Mineralization_of_VegetaleResidues
Calculate the nitrogen mineralised from fresh organic pool and the rate of N imobilisation, based on precedent crop
- rmn(i) - Nitrogen mineralised from fresh organic pool
- wim(i) - Nitrogen imobilisation rate
LIVESTOCK DATA
- N_UVM1 - from Calculator UVM (kgN/ha)
- Napp - number of manure applications
- Month(j) - month of manure application (j<= Napp)
- MonthStorage(j) - number of months for manure storing to be applied in application j (j<= Napp)
Subroutine Mineralization_Manure
Calculate the nitrogen in active and stable organic pool and the N mineralised based on data about the livestock size and manure management
Livestock Data
- Number of animal
- Total farm area
- Coefficients for each species
- Orgna(i) - Nitrogen in active organic pool
- Orgns(i) - Nitrogen in stable organic pool
- N_min(i) - Nitrogen mineralised fom active organic pool
Calculator UVM
Quantity of N applied from manure (kgN/ha/year)
Subroutine N_Balance
Calculate the final balance of N in soil, the N amount needed by crop and the amount of mineral fertilizer
- nn – the N need of actual crop
- Ndrained – the amount of N lost by drainage
- Min_fert – the mineral fertilizer amount
- Nneed_cor - the final mineral fertilizer amount taking into acoount the manure application