**Carbon Balance Model (CBM) Structure**

GPP

Plant respiration = Rd(Cl + Cs + Cr)

NPP

Storage pool, Cstorage

Allocation to Biomass

k.Cstorage

RGrowth

Y ~ 0.3

1-Y ~ 0.7

Cleaf

Cstem

Croot

af

as

ar

Clit

sf

Model equations:

The model only considers the instantaneous time frame (t = [i]), not the previous (t = [i-1]) or cumulative (t = [1,2,….,i]) C pool amounts.

ΔCstorage = Cstorage[i] - Cstorage[i-1] = GPP[i] - Rd[i]\*(Cleaf[i] + Cstem[i] + Croot[i]) - k[i]\* ΔCstorage[i])

ΔCstorage[i] = GPP[i] - Rd[i]\*(Cleaf[i] + Cstem[i] + Croot[i]) / (1 + k[i])

ΔCleaf[i] = af[i] \* (1-Y) \* k[i] \* ΔCstorage[i] - sf[i]\*ΔCleaf[i])

ΔCleaf[i] = (af[i] \* (1-Y) \* k[i] \* ΔCstorage[i]) / (1 + sf[i])

No turnover for either stem and root as these are free growing small seedlings (20 weeks old)

ΔCstem[i] = as[i] \* (1-Y) \* k[i] \* ΔCstorage[i]

ΔCroot[i] = (1 - af[i] - as[i]) \* (1-Y) \* k[i] \* ΔCstorage[i]

ar[i] = 1- af[i] - as[i]