Short rotation coppice (SRC) management basics

1 Planting

The control of planting a SRC is given by flag_reg:

flag_reg = 15 Aspen

flag_reg= 18 Black locust

and is realised in the subroutine planting. The number of plants is described in the input-file species.par by the seedrate per hectare.

2 Control of management (SR aspman_ini, asp_manag)

If flag_mg=8 a file <name>.man is necessary with following format:

#Management control file flag_mg = 8 aspen/black locust management

7 1 ! simulation year/ relative V-portion/

12 1

17 1

22 1

In each management year a total harvest is realised.

3 Sprouting after harvesting for Aspen and Black locust (SR asp_sprout)

a) starting root mass for sprouting:

crt – coarse root of the stock (of the cohort))

stumpw – biomass of the stump after harvest (height 10 cm)

Aspen:

Factor (3) – share of the sprouting (1-3) of the initial coarse root biomass (0.25, 0.333, 0.41666)

Black locust:

Fac_rob(5) – share of the sprout (1-5) of the initial coarse root biomass (0.0666, 0.1332, 0.1998, 0.2664, 0.334)

h_root(j) = factor(j) * (crt(i)*pf1 + stumpw(i)*pf2) for j =1,.,3

h_root(j) = fac_rob(j) * (crt(i)*pf1 + stumpw(i)*pf2) für j = 1,…,5

b) solution of the quadratic equation shoot/sapwood with regula falsi:

$$a \cdot W_s^b + W_s - h\_root = 0$$

W_s = root

mschelp = h_root

x1 = 0

x2 = 0.1

$$xacc = e^{-10}\,\frac{(x1 + x2)}{2}$$

$$root = rtflsp(weight, x1, x2, xacc)$$

tree_ini%x_sap = root [kg]

shoot = root*1000. [g]

rtflsp – regula falsi function for solving equation

c) foliage mass

tree_ini%x_fol= (spar(nsp)%seeda*(tree_ini%x_sap** spar(nsp)%seedb)) ![kg]

tree_ini%med_sla = spar(nsp)%psla_min + spar(nsp)%psla_a*0.5

tree_ini%t_leaf = tree_ini%med_sla* tree_ini%x_fol ! [m^{-2}]

tree_ini%ca_ini = tree_ini%t_leaf

d) fine root mass

tree_ini%x_frt = faktor * frt(i) ! [kg]

e) height

tree_ini%height = spar(nsp)%pheight1*(shoot*1000.)**spar(nsp)%pheight2

[cm] / [mg]

f) crown base height

tree_ini%x_hbole = stoh(8) (10 cm)

g) coarse roots

tree_ini%x_crt = (1-pf1) * crt(i)