Model for *Quercus pyrenaica* Castilla y León (Spain)

Model

Qpyrenaica__cyl__v01

Model description

- Specie: *Quercus pyrenaica* Willd.
- Spanish Forest Inventory (SFI) code: 43
- Geographical area: Castilla y León
- Geographical area (administrative): León, Palencia, Burgos, Zamora, Valladolid, Soria, Salamanca, Ávila and Segovia

Figure 1: *Quercus pyrenaica*

Figure 2: Details of *Quercus pyrenaica*

Model type

- Category: growth
- Model level: distance independent individual tree model
- Reproduction methods: seedling and coppice stands
- Stand structure: even-aged stands
- Species composition: monospecific stands
- Forest origin: natural

Model requirements and recommended use

- Initial inventory requirements: age and dominant height of the plot; expan and dbh of the trees
- Geographical area: Castilla y León, closer places and another places with similar characteristics (assuming differences)
- Stand type: monospecific stands
- Execution recommended time: 10 years executions (survival, growth and ingrowth equations developed by using that criteria)
- Site Index is defined as top height at a base age of 60 years

Figure 3: Provenance regions of *Quercus pyrenaica* in Spain

Bibliography

Complete SIMANFOR model recommended citation):

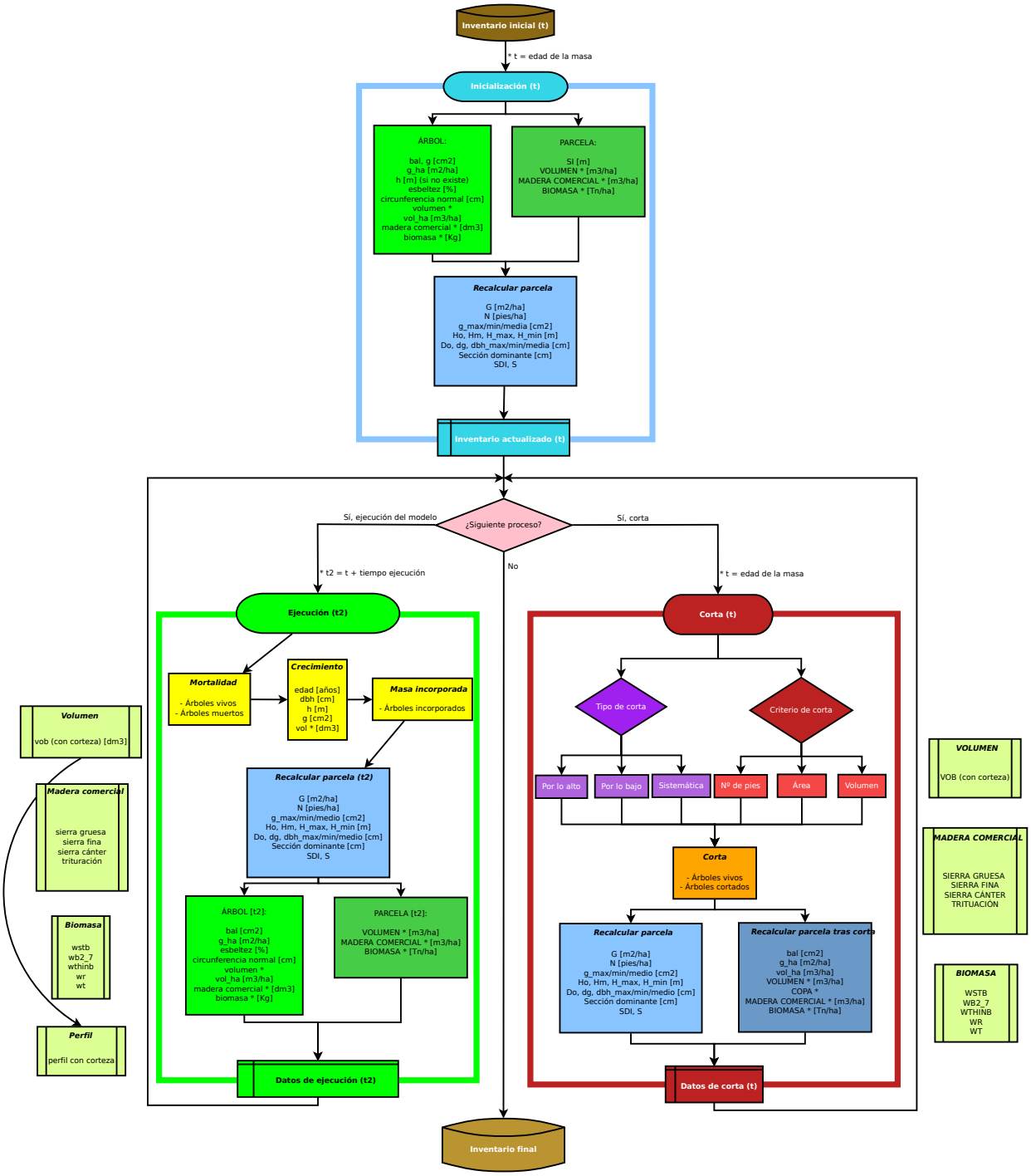
SIMANFOR (2022). Individual tree growth model independent from distance for pyrenean oak (*Quercus pyrenaica*) in Castilla and León (Spain).

Model components:

- **Site Index equations**:
  Adame P, Cañellas I, Roig S, del Río M (2006). Modelling dominant height growth and site index curves for rebollo oak (Quercus pyrenaica Willd.). Annals of Forest Science, 63(8), 929-940
- **Survival equation**:
  Adame P, del Río M, Cañellas I (2010). Modeling individual-tree mortality in Pyrenean oak (Quercus pyrenaica Willd.) stands. Annals of forest science, 67(8), 810
- **Diameter growth equation**:
  Adame P, Hynynen J, Cañellas I, del Río M. (2008). Individual-tree diameter growth model for rebollo oak (Quercus pyrenaica Willd.) coppices. Forest Ecology and Management, 255(3-4), 1011-1022
- **Ingrowth equation**:
  Adame P, del Río M, Cañellas I (2010). Ingrowth model for pyrenean oak stands in north-western Spain using continuous forest inventory data. European journal of forest research, 129(4), 669-678
- **Ingrowth distribution**:
  By default
- **General calculations: bal, g, slenderness, normal circumference**:
  Standard equations
- **Generalized height-diameter equation**:
  Adame P, del Río M, Cañellas I (2008). A mixed nonlinear height–diameter model for pyrenean oak (Quercus pyrenaica Willd.). Forest ecology and management, 256(1-2), 88-98
- **Taper equations over bark (volume)**:
  Rodríguez F, Lizarralde I (2015). Comparison of stem taper equations for eight major tree species in the Spanish Plateau. Forest systems, 24(3), 2
- **Biomass equations**:
  Ruiz-Peinado R, Montero G, del Rio M (2012). Biomass models to estimate carbon stocks for hardwood tree species. Forest systems, 21(1), 42-52
- **Technological wood uses information**:
  Rodríguez F (2009). Cuantificación de productos forestales en la planificación forestal: Análisis de casos con cubiFOR. In Congresos Forestales
- **Value for Reineke Index equation**:
  Standard

Figures:

- **Figure 1:** by Felipe Castilla, website: `http://www.arbolapp.es/especies/ficha/quercus-pyrenaica/`
- **Figure 2:** by Duhamel du Monceau, H.L., Traité des arbres et arbustes, Nouvelle édition [Nouveau Duhamel], vol. 7: t. 56 (1800-1803)
- **Figure 3:** extracted from MAPA


Inventario inicial (t)
* t = edad de la masa
Inicialización (t)
ÁRBOL:
bal, g [cm2]
g_ha [m2/ha]
h [m] (si no existe)
esbeltez [%]
circunferencia normal [cm]
volumen *
vol_ha [m3/ha]
madera comercial * [dm3]
biomasa * [Kg]
PARCELA:
SI [m]
VOLUMEN * [m3/ha]
MADERA COMERCIAL * [m3/ha]
BIOMASA * [Tn/ha]
Recalcular parcela
G [m2/ha]
N [pies/ha]
g_max/min/media [cm2]
Ho, Hm, H_max, H_min [m]
Do, dg, dbh_max/min/media [cm]
Sección dominante [cm]
SDI, S
Inventario actualizado (t)
¿Siguiente proceso?
Sí, ejecución del modelo
Sí, corta
No
* t2 = t + tiempo ejecución
* t = edad de la masa
Ejecución (t2)
Mortalidad
- Árboles vivos
- Árboles muertos
Crecimiento
edad [años]
dbh [cm]
h [m]
g [cm2]
vol * [dm3]
Masa incorporada
- Árboles incorporados
Recalcular parcela (t2)
G [m2/ha]
N [pies/ha]
g_max/min/medio [cm2]
Ho, Hm, H_max, H_min [m]
Do, dg, dbh_max/min/medio [cm]
Sección dominante [cm]
SDI, S
ÁRBOL [t2]:
bal [cm2]
g_ha [m2/ha]
esbeltez [%]
circunferencia normal [cm]
volumen *
vol_ha [m3/ha]
madera comercial * [dm3]
biomasa * [Kg]
PARCELA [t2]:
VOLUMEN * [m3/ha]
MADERA COMERCIAL * [m3/ha]
BIOMASA * [Tn/ha]
Datos de ejecución (t2)
Volumen
vob (con corteza) [dm3]
Madera comercial
sierra gruesa
sierra fina
sierra cánter
trituración
Biomasa
wstb
wb2_7
wthinb
wr
wt
Perfil
perfil con corteza
Corta (t)
Tipo de corta
Criterio de corta
Por lo alto
Por lo bajo
Sistemática
Nº de pies
Área
Volumen
Corta
- Árboles vivos
- Árboles cortados
Recalcular parcela
G [m2/ha]
N [pies/ha]
g_max/min/medio [cm2]
Ho, Hm, H_max, H_min [m]
Do, dg, dbh_max/min/medio [cm]
Sección dominante [cm]
SDI, S
Recalcular parcela tras corta
bal [cm2]
g_ha [m2/ha]
vol_ha [m3/ha]
VOLUMEN * [m3/ha]
COPA *
MADERA COMERCIAL * [m3/ha]
BIOMASA * [Tn/ha]
Datos de corta (t)
VOLUMEN
VOB (con corteza)
MADERA COMERCIAL
SIERRA GRUESA
SIERRA FINA
SIERRA CÁNTER
TRITUACIÓN
BIOMASA
WSTB
WB2_7
WTHINB
WR
WT
Inventario final

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Interest Links

SIMANFOR - Support system for simulating Sustainable Forest Management Alternatives. Accessed 11 May 2021, in `https://www.simanfor.es/`

iuFOR - Sustainable Forest Management Research Institute UVa-INIA. Accessed 11 May 2021, in `http://sostenible.palencia.uva.es/`

ETSIIAA Palencia - Higher Technical School of Agricultural Engineering of Palencia. Accessed 11 May 2021, in `http://etsiiaa.uva.es/`

UVa - University of Valladolid. Accessed 11 May 2021, in `https://www.uva.es`