

SIMANF{OR}

Model for *Pinus pinea* Central Mountains (Spain)

Model

Ppinea_sc_v01

Model description

- Specie: *Pinus pinea* L.
- Spanish Forest Inventory (SFI) code: 23
- Geographical area: Central Mountains
- Geographical area (administrative): Palencia, Zamora, Valladolid, Burgos, Salamanca, Ávila, Segovia y Madrid

Model type

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

Model requirements and recommended use

- Initial inventory requirements: age, dominant height and basal area of the plot; expan and dbh of the trees
- Geographical area: Sistema Central, closer places and another places with similar characteristics (assuming differences)
- Stand type: monospecific stands
- Execution recommended time: 5 years executions (growth equation developed by using that criteria)
- Site Index is defined as top height at a base age of 100 years



Figure 1: *Pinus pinea*



Figure 2: Details of *Pinus pinea*

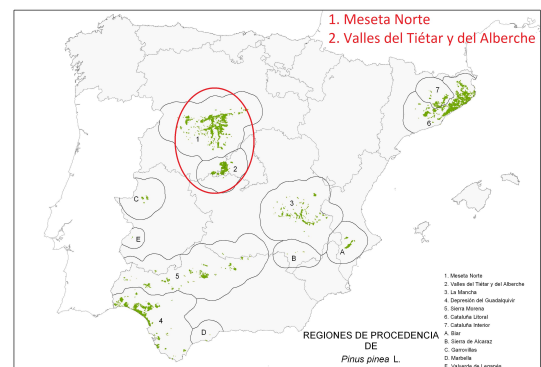


Figure 3: Provenance regions of *Pinus pinea* in Spain

Bibliography

Complete SIMANFOR model recommended citation):

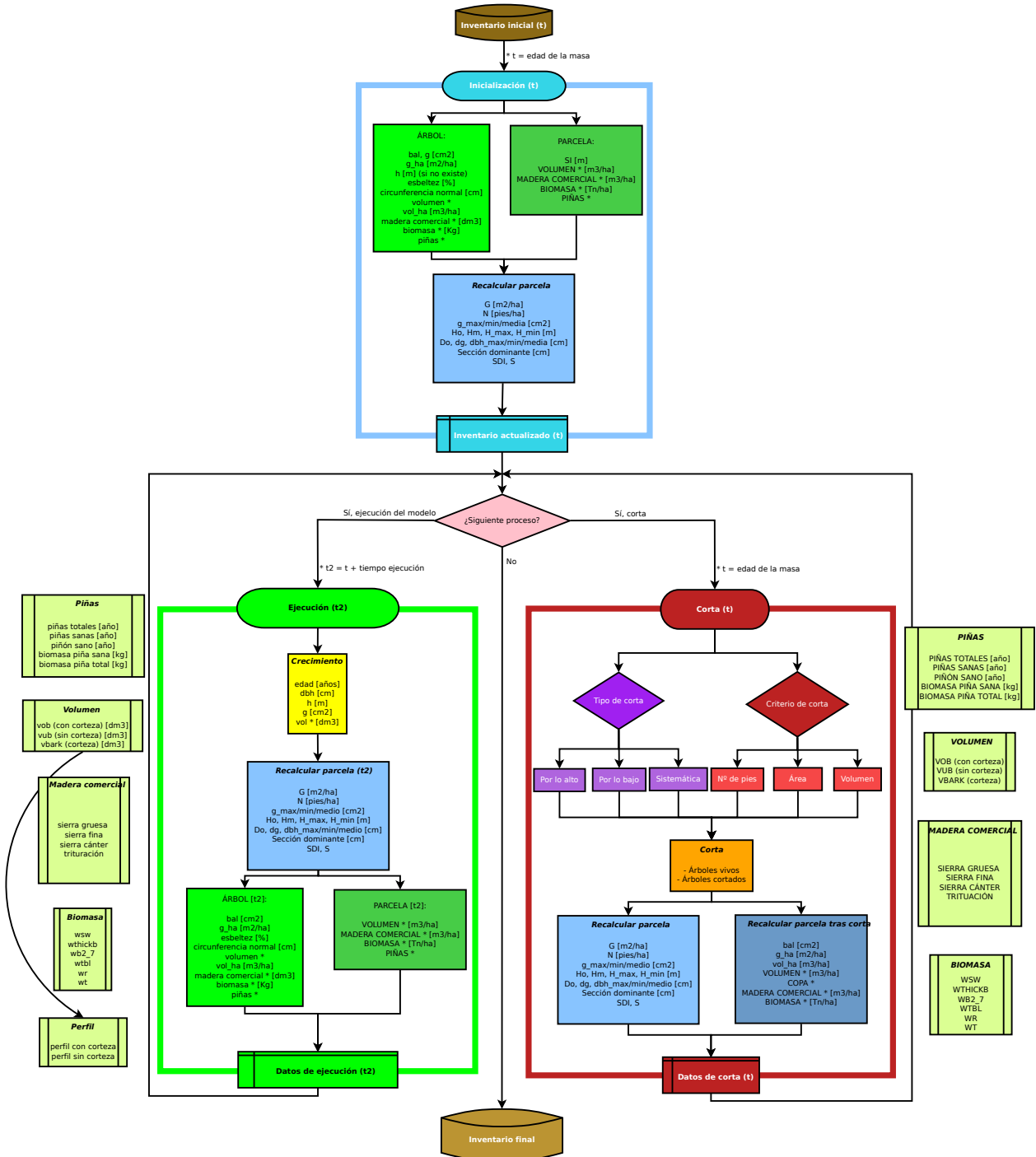
SIMANFOR (2022). Individual tree growth model independent from distance for stone pine (*Pinus pinea*) in Central Mountains (Spain).

Model components:

- **Site Index equations:**
Calama R, Cañadas N, Montero G (2003). Inter-regional variability in site index models for even-aged stands of stone pine (*Pinus pinea* L.) in Spain. *Annals of Forest Science*, 60(3), 259-269
- **Diameter growth equation:**
Calama R, Montero G (2005). Multilevel linear mixed model for tree diameter increment in stone pine (*Pinus pinea*): a calibrating approach. *Silva Fenn*, 39(1), 37-54
- **General calculations: bal, g, slenderness, normal circumference:**
Standard equations
- **Generalized height-diameter equation:**
Calama R, Montero G (2004). Interregional nonlinear height diameter model with random coefficients for stone pine in Spain. *Canadian Journal of Forest Research*, 34(1), 150-163
- **Taper equation 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
- **Taper equation under bark (volume):**
Calama R, Montero G (2006). Stand and tree-level variability on stem form and tree volume in *Pinus pinea* L.: a multilevel random components approach. *Forest Systems*, 15(1), 24-41
- **Biomass equations:**
Ruiz-Peinado R, del Río M, Montero G (2011). New models for estimating the carbon sink capacity of Spanish softwood species. *Forest Systems*, 20(1), 176-188
- **Technological wood uses information:**
Rodríguez F (2009). Cuantificación de productos forestales en la planificación forestal: Análisis de casos con cubiFOR. In *Congresos Forestales*
- **Cone production equations (total):**
Calama R, Gordo FJ, Mutke S, Montero G (2008). An empirical ecological-type model for predicting stone pine (*Pinus pinea* L.) cone production in the Northern Plateau (Spain). *Forest Ecology and Management*, 255(3-4), 660-673
- **Healthy cones and seed production equations:**
Calama R, Montero G (2007). Cone and seed production from stone pine (*Pinus pinea* L.) stands in Central Range (Spain). *European Journal of Forest Research*, 126(1), 23-35
- **Value for Reineke Index equation:**
Aguirre A, Condés S, del Río M (2017) Variación de las líneas de máxima densidad de las principales especies de pino a lo largo del gradiente estacional de la Península Ibérica. 7 Congreso Forestal Español

Figures:

- **Figure 1:** by Manfred Werner is licensed under CC BY-SA 3.0
- **Figure 2:** website: <https://www.pinterest.es/pin/443182419564410245/>
- **Figure 3:** extracted from MAPA



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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>

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