

SidaTim

NOVEL PATHWAYS OF BIOMASS PRODUCTION:
ASSESSING THE POTENTIAL OF *SIDA HERMAPHRODITA* AND VALUABLE TIMBER TREES



The two aspects of SidaTim: Growing the innovative multipurposeplant *Sida hermaphrodita* and prunedvaluable timber trees.

1° Call:	2015
Project period:	05/2016 - 04/2019
Topic:	Agricultural production systems, farming practice, plant production and horticulture, supply chain, marketing and consumption.
Keywords:	Biomass, <i>Sida hermaphrodita</i> , <i>Silphium perfoliatum</i> , agroforestry systems
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Website:	facceturplus.org/research-projects-1st-call/sidatim/ www.sidatim.eu

BACKGROUND

Current trends in agriculture foster intensification of the cultivation management that often results in monoculture cultivation, nitrate leaching, soil erosion, and biodiversity decline. Also, the European woody biomass economy indicates that wood produced in forests, both for energy and for timber, will not cover future demand. Hence, new land use approaches are needed to enhance the sustainability of agriculture and the production of lignocellulosic biomass. One approach to achieve this goal lies in the optimized management of agroforestry systems, i.e. growing trees in combination with other crops on the same land unit.

OBJECTIVE

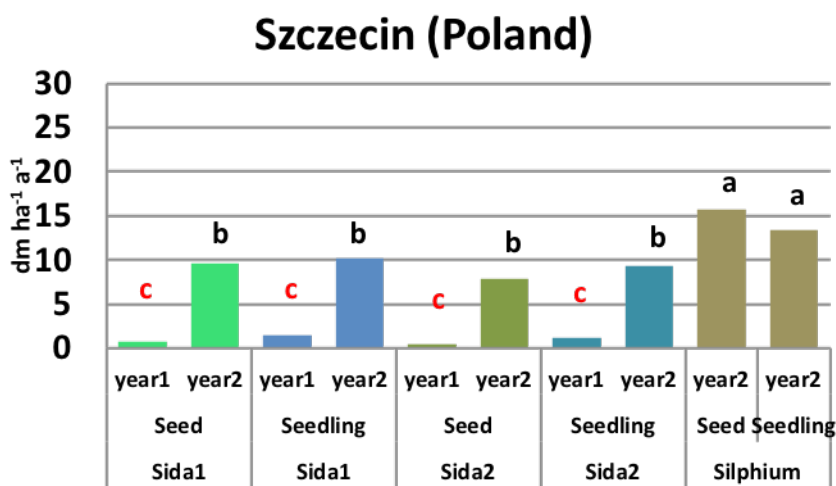
SidaTim assesses the potential of agroforestry systems that consist of valuable timber trees grown in combination with biomass plants such as *Sida* and *Silphium*.

METHODOLOGY

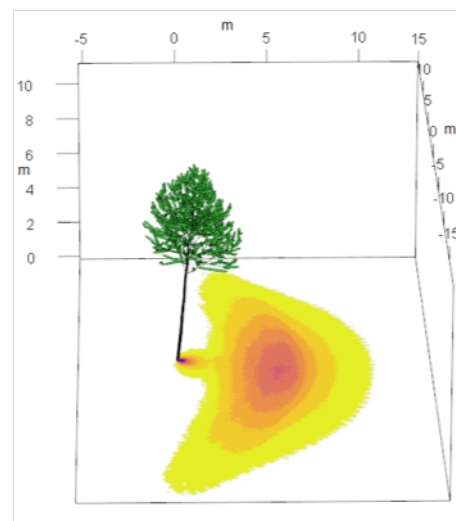
- Establish, manage and monitor experimental field sites with *Sida* and *Silphium* with regard to biomass production and ecological aspects,
- Develop growth, carbon storage, and crown shading models for valuable timber trees on agricultural land (including pruning treatment),
- Combine the two research foci; model agroforestry systems; evaluate economics of the management systems,
- Address farmers, biomass consumers, policymakers.

RESULTS AND KEY FINDINGS

Below, we present key findings pertaining to the two foci of SidaTim.



Biomass yields of *Sida* and *Silphium* in the first two years of growth. The data pertain to experimental plots in Poland with two provenances of *Sida* and one provenance of *Silphium*. All were established using seeds and seedlings.



Three-dimensional tree-model derived from terrestrial laser scans and its shadow projection, showing the annual solar energy reduction on the ground below.

KEY PUBLICATIONS

- Nahm M, Morhart C (2018). Virginia mallow (*Sida hermaphrodita* (L.) Rusby) as perennial multipurpose crop: biomass yields, energetic valorization, utilization potentials, and management perspectives. *GCB Bioenergy*, 10, 393–404. doi: 10.1111/gcbb.12501.
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- Roskopf E, Morhart C, Nahm M (2017). Modelling shadow using 3D tree models in high spatial and temporal resolution. *Remote Sensing* 9, Article ID: 719. doi: 10.3390/rs9070719.