

Project Name | +PINHÃO – Integrated management of biotic agents associated with loss of stone pine seeds production

Project Code | PDR2020-101-031185

Main Purpose | Develop diagnostic and monitoring processes to determine the impact of pests on pine cones and seeds production, in particular the seed bug *Leptoglossus occidentalis*

Intervention Region | Portugal

Beneficiary Entity | ISA - Instituto Superior de Agronomia (Project leader)

Partners |

- UNAC - União da Floresta Mediterrânica
- Anta de Cima – Sociedade Agrícola, Unipessoal Lda.
- Companhia das Lezírias S.A.
- Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa
- Florgénese – Produtos e Serviços para a Agricultura e Florestas Unipessoal Lda.
- Herdade da Abegoaria – Sociedade Agrícola Lda.
- ICNF – Instituto da Conservação da Natureza e das Florestas I.P.
- INIAV – Instituto Nacional de Investigação Agrária e Veterinária I.P.
- Pedro Miguel Belo Ramos Courinha Martins
- Pedro Sacadura Teixeira Cabral Duarte da Silveira
- Sociedade Agrícola Monte da Sé Lda.
- Viveiros da Herdade da Comporta – Produção de Plantas Ornamentais Lda.

Approval date | 2017/12/06

Starting Date | 2018/02/01

Date of the conclusion | 2021/12/31

Total Eligible Cost | 123.771,31€

European Union financial support | 74.262,81€

National Public Financial Support | 18.565,73€

Expected results

- Characterization at regional level of pine cone production cycles and the patterns of temporal evolution;
- Quantification of damages caused by *Leptoglossus occidentalis* (*L. occidentalis*) and other pests with implications for the loss of pine cones and seeds, in order to determine economic levels of attack in integrated management processes;
- Identification of phenological stages at risk and definition of phenological stages of the plant to be protected by preventive or control measures;
- Identification of potential auxiliary biotic agents in the control of *L. occidentalis*;
- Strategies to prevent the transmission of diseases by *L. occidentalis*;
- Development of traps for monitoring and capture of *L. occidentalis* and *Dioryctria mendacella* with potential interest in control strategies;
- Strategies for preventive forestry and good practices suitable for the prevention of biotic agents;
- Warning system against harmful biotic agents of pine cones – SAFEPINEA.

Divuligation and Activities

EVENTS

- Divuligation on the UNAC website: <http://www.unac.pt/index.php/id-i/grupos-operacionais-accao-1-1-pdr2020/pinhao>
- Disclosure of the project on the Rede Rural Nacional (RRN) website: <https://inovacao.rederural.gov.pt/2/67-gestao-integrada-de-agentes-bioticos-associados-a-perda-de-producao-do-pinhao-pinhao>

SCIENTIFIC PUBLICATIONS

- Farinha, A., Carvalho, C., Correia, A., Branco, M. Long term impact assessment of *Leptoglossus occidentalis* in *Pinus pinea* L.: integrating population density and seed loss. In prep.
- Bragança, H., Silva, A., Henriques, J., Diogo, E., Ramos, P. (2020). *Sydowia polyspora*—um novo fungo associado à doença dos ápices do pinheiro-manso. *Vida Rural*, Dossier técnico, 42-44.
- Farinha, A., Silva, J., Correia, A., Sousa, E., Roques, A., Branco, M. (2018). Is *Leptoglossus occidentalis* entirely responsible for the high damage observed on cones and seeds of *Pinus pinea*? Results from a fertirrigation trial in Portugal. *Forest Ecology and Management*, 429: 198-206. <https://doi.org/10.1016/j.foreco.2018.07.014>
- Farinha, A., Durpoix, C., Valente, S., Sousa, E., Roques, A., Branco, M. (2018) The stone pine, *Pinus pinea* L., a new highly rewarding host for the invasive *Leptoglossus occidentalis*. *NeoBiota*, 41: 1-18. <https://doi.org/10.3897/neobiota.41.30041>