

# ZeroParasitic

## Innovative sustainable solutions for broomrapes: prevention and integrated pest management approaches to overcome parasitism in Mediterranean cropping systems

Demosthenis Chachalis<sup>1</sup>, Eleni Tani<sup>2</sup>, Francisco P. Alfocea<sup>3</sup>, Mohamed Kharrat<sup>4</sup>, Mark Bonazountas<sup>5</sup>, Demosthenis Katsis<sup>6</sup>, Lamiae Ghaouti<sup>7</sup>, Esmat M.Hegazi<sup>8</sup>, Nizar Haddad<sup>9</sup>, Markus Albert<sup>10</sup>

- 1 Benaki Phytopathological Institute (BPI), Greece
- 2 Agricultural University of Athens (AUA), Greece
- 3 Centro de Edafologia Biologia Aplicadadel Segura (CSIC- CEBAS), Spain
- 4 InstitutNational de RechercheAgronomique de Tunisie, (INRAT), Tunisia
- 5 EPSILON SA, Malta
- 6 Agroland SA, Greece
- 7 Institut Agronomiqueet Veterinaire Hassan II, IAV Hassan II (IAV) Morocco
- 8 Alexandria University (AU), Egypt
- 9 National Centre for Agricultural Research and Extension (NARC), Jordan
- 10 University of Tübingen (UTU) Germany



### Project outline

ZeroParasitic is a three-year project, aiming to deliver innovative sustainable solutions to overcome broomrape plant parasitism in key Mediterranean cropping systems.

**Genetic and molecular** approaches will be used at three critical levels to gain new insights on potential regulatory targets of the infection: the broomrapes per se, the host plants and their interaction (host-parasite). Research will target two of the most important crops in the Mediterranean. i.e. industrial tomato and faba beans.

**Surveillance tools** utilizing remote and satellite images will be employed for monitoring parasitism and for large-scale documentation. Innovation tools will consist of molecular approaches for screening and identification of tolerant/resistant hosts and hormone host-parasite interactions.

Deciphering the molecular basis for resistance utilizing host **pattern recognition receptors (PRRs)** and **parasitic defense-triggering molecules** aiming to support breeding of resistant host plants.

Solutions will be integrated in an integrated pest management (**IPM**) **context** targeting several innovations such as prevention, biological/non-chemical approaches, and other IPM strategies. Agronomic practices will be scientifically supported by a validated model for prediction of parasitism emergence across various Mediterranean locations and farming systems.

Solutions will be **socioeconomically evaluated**, implemented and disseminated in a participatory way. The dissemination of the Project outputs will be based on a systems-thinking approach and the solutions that will be proposed will be highly accessible via an innovative web platform designed to satisfy requirements of a wide range of end-users.

