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OASIS S.r.l.

Research & Development Center — Research Organization

BIOLOGICAL CONTROL AND EVOLUTION OF AGRONOMIC POLICIES

Winning Strategy for the Preservation of Chestnut Groves

+15 Years of experience in the field	+16 Years of R&D projects (2010–2026)	+200 Release sites monitored	∞ Commitment to sustainability
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1. Who We Are and Our Mission

Founded in 2004 and active in the biological control of the Chestnut Gall Wasp since 2009, OASIS s.r.l. is today one of Italy's most specialized applied research centers in this field. With over 15 years of field experience, the company has accumulated a unique scientific and operational heritage, positioning it as a national reference in the development and implementation of biological control protocols using *Torymus sinensis*.

OASIS s.r.l. is a Research & Development Center and Research Organization that, since 2009, has been carrying out cutting-edge activities aimed at combating the spread of the Chestnut Gall Wasp (*Dryocosmus kuriphilus*) and systematically introducing biological control across the national territory. Our mission is to safeguard the health and productivity of Italian chestnut forests, while preserving biodiversity and the ecosystem integrity of the territory.

Our structure operates in close synergy with leading public and private research centers, as well as with the country's major universities, to ensure a rigorous scientific approach that is constantly updated with the latest phytosanitary and agronomic developments.

Scientific Rigor	Real Impact	Strategic Partnership
Protocols validated by international literature and +15 years of field work	Documented results at hundreds of release sites across Europe	Synergy with universities, public bodies and private agricultural operators

2. Historical R&D Projects (2010–2026)

Over more than sixteen years, OASIS s.r.l. has consolidated its position as a reference Research Organization in the national phytosanitary landscape, participating as a strategic scientific partner in numerous applied research projects funded by regional, national, and European public sources.

The complete portfolio of projects and scientific publications is available at: <https://www.oasissrl.it/news/divulgazione-scientifica-odr/>. Each project represents not only a contribution

to the advancement of knowledge, but a direct investment in the operational effectiveness of biocontrol protocols applied in the field.

2009	Start of biological control activities with <i>Torymus sinensis</i> in Italy
2010	First R&D project as an accredited Research Organization.
2015+	Expansion to more European regions, consolidation of thermal protocols and mass production.
2020+	Integration of biostimulants and agronomic practices into the operational protocol
2026	Over 16 years of longitudinal monitoring and parasitization data

3. The Phytoclimatic Context and Biological Control

All European chestnut growing areas are today affected by the invasion of the Chestnut Gall Wasp, a hymenopteran that causes plant decline, drastic reduction of fruit production, and compromise of timber yield. Traditional chemical control is impractical and highly damaging to the forest ecosystem.

*Scientific Note: Integrated biological control represents the only structural and sustainable long-term solution for controlling the Chestnut Gall Wasp, implemented through the targeted introduction of its natural antagonist: the parasitoid *Torymus sinensis*.*

4. Guidelines and Agronomic Support Policies

The prescriptions below are not generic recommendations: they are the direct result of over 15 years of field experimentation, continuous monitoring, and laboratory analyses conducted by OASIS s.r.l. at thousands of release sites across the European territory. Every line of this protocol has been tested, refined, and validated based on real data on parasitization rates, phenology, and vegetative response of the host plants.

The effectiveness of *Torymus sinensis* releases does not depend exclusively on the biological quality of the introduced material and the precision of thermal management protocols for the climate chamber, but is decisively conditioned by the agronomo-cultural context in which the adult parasitoids operate after emergence. OASIS s.r.l. has integrated into its operational protocol an organic set of prescriptions and cultural practices validated by scientific literature and over 15 years of applied experience.

1. Suspension of drastic pruning in the two years following releases.

Dry galls remaining attached to branches from the previous season constitute the exclusive living and reproductive substrate in which *Torymus sinensis* larvae and pupae complete their winter development. All drastic crown renovation is prohibited between November and May; routine sanitary pruning is permitted provided it avoids removing branches with the highest density of previous-year dry galls.

2. Controlled management of undergrowth and conservation of spontaneous blooms.

Adult *Torymus sinensis* supplement their metabolism through nectar and honeydew from spontaneous flowering plants in the undergrowth and herbaceous layer. Indiscriminate mechanical mulching and mowing must be limited between March and May, encouraging the presence of *Ranunculus* spp., *Veronica* spp., *Stellaria media*, and wild Apiaceae.

3. Organic nutrition and root and foliar biostimulation.

The protocol provides for the use of organic amendments (mature compost or certified solid digestate, 2–4 t/ha) applied in post-harvest autumn and foliar biostimulants based on protein hydrolysates and free amino acids (optionally with *Ascochyllum nodosum*) during spring vegetative regrowth. All products must be permitted under the organic farming regulations (EU Reg. 2018/848).

4. Absolute prohibition of broad-spectrum insecticides during the parasitoid flight window.

The period from April 1 to May 31 represents the window of maximum biocontrol sensitivity. Any broad-spectrum insecticide (pyrethroids, organophosphates, neonicotinoids) applied to the canopy during this period would completely nullify the investment in releases. Only selective active substances compatible with organic production are permitted: copper, sulfur, spinosad, kaolin, white mineral oils, *Bacillus thuringiensis*.

5. Prohibition of burning pruning residues during the winter period (October–May).

Galls on pruning branchlets contain *Torymus sinensis* larvae and pupae in diapause: their combustion causes direct and irreversible destruction of a significant portion of the overwintering population. Pruning residues must be chipped and left on the soil as organic mulch, or disposed of outside the release area.

6. Integrated phenological monitoring and precise calibration of releases.

Each release is preceded by a phenological survey to verify the optimal gall stage (diameter >3 mm, not yet lignified) and is integrated with thermal accumulation data (degree-days, base 10°C) provided by OASIS s.r.l. This phenological synchronization — developed and refined over 15 years of field experience — is the single factor that most differentiates the effectiveness of OASIS protocols from uncalibrated approaches.

5. Service Catalog

OASIS s.r.l. offers chestnut sector operators, agricultural enterprises, and local authorities a turnkey package of specialized services, all backed by over 15 years of research and direct field intervention:

1. Supply of *Torymus sinensis* Establishment Colonies

Each standard release batch — the result of a rigorous biological selection and certification process — consists of approximately 110 selected females and 60 males, distributed evenly in 10 ready-to-use test tubes. Where necessary, technical field assistance is provided to carry out releases within the ideal temporal windows and bioclimatic conditions.

2. Design and Implementation of Multiplication Facilities

Specialist consultancy and assistance — based on direct hands-on experience — for the establishment of company-level or district-level *Torymus sinensis* multiplication centers, adapting intervention timing to the specific climatic and topographic requirements of the local territory.

3. Post-Release Monitoring and Diagnostics

Technical sampling and laboratory analysis service to verify effective establishment and parasitization rates at previous release sites. Our longitudinal database — built over more than 15 years — enables comparison with regional and national benchmarks, providing contextualized interpretations of high diagnostic value.

4. Professional Training Courses

Theoretical-practical training programs for chestnut growers, agronomists, agricultural technicians, and agricultural surveyors, structured around accumulated operational experience and continuously updated with the latest monitoring and research data: advanced agronomic management of chestnut groves and biological control techniques against the Gall Wasp.



OASIS S.r.l. — Over 15 Years of Innovation in Service of Sustainable Agriculture

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