

CHALLENGES

● CHALLENGE 1 PREDICTIVE AGRICULTURE

We are seeking solutions and technologies to analyze, interpret, and leverage data to address the complex challenges of modern agriculture in tobacco cultivation. We are looking for technologies capable of:

- **Utilizing historical and real-time data** to improve the understanding of crop dynamics.
- **Providing predictive models** for fast and targeted decision-making.
- **Supporting farmers and the supply chain** in optimizing resources and reducing waste.

What we are looking for

While maintaining an open approach to the best technological solutions, we are particularly interested in proposals that include one or more of the following functionalities:

- **Crop quality**
 - Predictive analysis of sugar and nicotine levels in tobacco leaves.
- **Production efficiency**
 - Yield optimization per hectare through models based on historical and environmental data.
- **Climate risk management**
 - Systems for forecasting and mitigating the impacts of extreme weather events
- **Integrated yield assessment**
 - Solutions to monitor and ensure quality throughout all stages of the production process..

● CHALLENGE 2 CURING, PROCESSING AND STORAGE

We are seeking solutions and technologies to address key aspects of the tobacco supply chain:

- **Reducing CO2 emissions during tobacco curing**
 - Technologies or systems to improve energy efficiency, integrate renewable energy, innovate drying and curing methods, or apply advanced materials to minimize the carbon footprint.
- **Green alternatives to tobacco fumigation in storage**
 - Sustainable solutions for pest control that eliminate the use of fumigants while ensuring tobacco quality and safety during storage.
- **Sustainable and multifunctional packaging**
 - Alternative packaging solutions to cardboard that are reusable and designed with a circular economy approach. Proposals should include additional functionalities, such as pest management support, while ensuring the quality of the transported product.

WHAT WE ARE LOOKING FOR

While maintaining an open approach to the best technological solutions, we are particularly interested in proposals that include one or more of the following functionalities

- **Advanced drying methods:** energy-efficient systems leveraging renewable energy sources, technologies, or materials to optimize energy consumption.
- **Natural pest management solutions:** innovative approaches such as thermal or atmospheric treatments or the use of natural substances to prevent infestations.
- **Advanced packaging materials:** designed to be reusable, lightweight, and with a reduced carbon footprint.
- **Integrated sustainability models:** application of circular economy principles to enhance both the curing and storage phases.

● CHALLENGE 3 INNOVATION IN HARVESTING AND PROCESSING

The sought solutions focus on two key aspects of the tobacco supply chain:

- **Innovative machines for harvesting high-density tobacco plantations**
 - Significant heights and vegetative mass:
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 - Adaptability to high-density planting patterns.
 - Preservation of leaf quality while ensuring economic sustainability for farmers.
- **Technologies for cleaning tobacco during processing**
 - Solutions that efficiently and cost-effectively remove foreign substances (organic and non-metallic inorganic) from tobacco during processing, ensuring the quality of the final product.

WHAT WE ARE LOOKING FOR

While maintaining an open approach to the best technological solutions, we are particularly interested in proposals that include one or more of the following functionalities:

- **Automation and robotics for harvesting:** Advanced machinery equipped with artificial intelligence systems or adaptive mechanisms to operate under high-density conditions without compromising yield or quality.
- **Innovative cleaning systems:** technologies based on suction, mechanical separation, or advanced sensors to detect and remove impurities efficiently.
- **Sustainability and economic efficiency:** solutions that balance technological innovation with sustainable operational costs for both the industry and farmers.

● CHALLENGE 4 BEYOND TOBACCO

We are seeking disruptive solutions and technologies that combine PM Italia's expertise in tobacco processing with innovative technologies or business models. The goal is to create new complementary commercial avenues, leveraging the potential of tobacco and other crops for unexplored applications.



WHAT WE ARE LOOKING FOR

Examples of areas of interest include:

- **Sustainable biomaterials**
 - Development of innovative materials derived from tobacco or other crops, such as biodegradable packaging, eco-friendly fabrics, or bioplastics.
- **New products for emerging sectors**
 - Ideas for using tobacco and other plants as a base for innovative products in cosmetics, pharmaceuticals, nutraceuticals, food, or energy (e.g., bioenergy).
- **Valorization of by-products**
 - Solutions to transform by-products from tobacco or other crops into valuable resources for new industries, embracing circular economy principles.

● CHALLENGE 5 OPTIMIZATION OF RECONSTITUTED TOBACCO SHEET PRODUCTION

We are looking for solutions that can reduce the viscosity loss in the tobacco cast leaf slurry production. The viscosity in fact is reduced to a level which sheet cannot be formed (strength is very low).

A hypothesis is that viscosity loss is caused by the activity of the **Endo-β-mannanases** enzyme present in the tobacco. Our objective is to find potential alternative treatment to reduce the viscosity drop during slurry preparation of reconstitute tobacco operation and potential action on the agricultural practices to reduce enzyme formation.

WHAT WE ARE LOOKING FOR

- **Root Cause Analysis & Validation:**
 - Identify the main causes of viscosity drop during the mixture of tobacco for the production of the slurry and, eventually, confirm the hypothesis of endo-mannanase as main cause.
- **Production:**
 - Potential alternative treatment to reduce the viscosity drop during slurry preparation of reconstitute tobacco operation.
- **Agro-practices:**
 - potential action on the agricultural practices to reduce enzyme formation.



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