

# Scientists are Looking for New Varieties of Rice to Combat the Apple Snail and the Effects of Climate Change on this Crop

- **Crosses between certain varieties of Asian and European rice will enable new salt-tolerant varieties to be developed.**
- **The NEURICE project is coordinated by the University of Barcelona and comprises research centers and companies from six different countries.**

## **Climate Change is Threatening Rice Growing in Europe**

Rice production in Europe, which currently accounts for two-thirds of the rice consumed in the continent, is being threatened by the effects of climate change, as is occurring with other crops.

In the Mediterranean area, climate change is leading to an increase in temperatures and more frequent and severe periods of drought, which are harming water quality and river flows. These effects are increasing the salinity of the soil, which has a negative impact on crop productivity. Climate change is also causing the sea level to rise and further increasing salinity in the coastal areas, deltas and river mouths where rice is grown. As a result, it is threatening the very existence of the rice sector in the Mediterranean area.

The NEURICE project (New commercial European RICE) is aiming to obtain new varieties of salt-tolerant rice. Varieties of European rice will thereby be obtained which are suited to the new conditions, thus enabling rice growing to continue without losing productivity and maintaining the positive environmental, scenic and socio-economic impact of this activity.

## **The Giant Apple Snail and the Ebro Delta**

In Catalonia, the Ebro Delta has been threatened for a number of years by an invasive species which has devastating effects on the rice harvest: the giant apple snail (*Pomacea maculata*). Its high reproductive capacity and the absence of natural predators means it has been impossible to halt its expansion within the Delta, causing increasing damage to crops.

Flooding fields with seawater has been one of the few strategies which has managed to curb the presence of the giant apple snail, taking advantage of the fact that it does not tolerate high salinity levels. Unfortunately, the residual salinity following the treatment with seawater generates losses in the crops which, in the worst cases, can affect up to 30% of production.

Therefore, in Catalonia, the NEURICE project not only provides a solution for adapting rice varieties to climate change, it will also enable us to combat the invasion of the apple snail.

### **Incorporating the Salt Tolerance of Tropical Varieties**

In Asia there are some tropical varieties of rice which are highly tolerant to salinity but which cannot be grown in the Mediterranean climate and are not commercially viable. It has recently been discovered that the salinity tolerance of these tropical Asian varieties is due to the presence of a chromosome segment called *Salto1*. Traditional, non-transgenic improvement techniques will be used to incorporate this feature into the commercial European varieties.

### **Will Salt-tolerant Varieties be as Good as the Current Ones?**

Studying the performance of the new varieties is one of the tasks of the project. The first tests will be performed on hydroponic crops in greenhouses, an environment that will enable an assessment of the degree of salinity tolerance of the new varieties in a controlled manner, which will be more effective and faster than in the field.

Once the most salt-tolerant varieties have been identified, they will be tested in the rice fields of the deltas of the Ebro (Spain), Po (Italy) and Rhône (France) from 2018 onwards. These varieties will be grown in fields with salinity and without salinity in order to compare agronomic production and performance.

The salinity-tolerant varieties which pass the tests in the fields will be registered and marketed so that the rice producers in these areas can continue to perform their activity under conditions of high salinity.

### **About Neurice project.**

The NEURICE project, presented within the call Sustainable Food Security and the sub-call of: H2020-SFS-2014-2015 and Topic: Strategies for crop productivity, stability and quality SFS-05-2015, explicitly considers improving identification, prediction and introduction of useful genetic variation in crops while seeking for novel breeding targets to improve yield, yield stability, quality, biotic/abiotic stress resistance/tolerance and environmental benefits.

This project will bring together experts in diverse fields such as biotechnology, plant physiology, farming and agriculture development, electrophysiology and cell signalling and salinity monitoring systems, thereby fostering new opportunities for training and additional collaborative research:

[Universitat de Barcelona](#)

[Centre de Recerca en Agrogenòmica \(CRAG\)](#)

[CIRAD](#)

[Consiglio per la Ricerca in Agricoltura e l'Analisi dell'Economia Agraria \(CREA\)](#)

[Universitat de Milà](#)

[Universitat de Glasgow](#)

[Institut de Recerca en Tecnologia Agroalimentària \(IRTA\)](#)

[Institute of Crop Science – Chinese Academy of Agricultural Sciences \(ICS-CAAS\)](#)

[Instituto de Agrobiotecnología de Rosario \(INDEAR\)](#)

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*Egg masses from apple snails show a bright pink colour / Picture: IRTA*



*IRTA researchers monitor soil salinity at Ebro Delta rice fields / Picture: IRTA*

**More information:** [www.neurice.eu](http://www.neurice.eu)