

ANOVA-PLUS AT THE HEART OF THE BATTLE AGAINST FLAVESCENCE DORÉE, A DISEASE THAT THREATENS EUROPEAN VINEYARDS

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Anova-Plus, an innovative start-up located on the Genopole campus in Évry, France, is developing a rapid diagnostic test for flavescence dorée, a serious and currently incurable phytoplasmic disease of grapevines. Viticulturists will be able to perform the DNA test themselves and thus quickly identify infected vine stocks. Scheduled for marketing in 2015, the test will help to limit the spread of this quarantine-necessitating disease and improve the use of pesticides.



Anova-Plus develops, manufactures and commercializes rapid test kits for the in-the-field detection of microorganisms, in particular agricultural pathogens. This rapid and affordable detection of pathogens is made possible by isothermal amplification, an innovation that allows DNA amplification at a constant temperature. The results of these tests are read simply from a flow strip.

Anova-Plus is specialized in the detection of phytoplasmas, a type of bacteria lacking the typical bacterial cell wall. They are globally-distributed plant pathogens that infect the majority of agricultural species, including grapevines, fruit trees, vegetables and even cereals, with the capacity to destroy entire harvests. Phytoplasmas are transmitted by flying insect vectors, mainly Cicadellidae (leafhoppers), which makes them highly contagious. Molecular biology studies have identified genetic variations of phytoplasmas and resulted in precise diagnostic tools based on the detection of their DNA.

Phytoplasmas destroying French vineyards

Currently, the French wine industry represents 50% of agricultural employment and the second largest source of foreign currency in France. Since the 1960s, not only the vineyards of France but also those of all of southern Europe have been battling with flavescence dorée, a phytoplasmic disease for which both quarantine and treatment are obligatory. Sixty percent of French vineyards are affected by the disease. French law obliges the uprooting of infected vine stocks and the intensive use of insecticides in the affected area to limit the population of the insect vector. The law goes so far as to oblige the uprooting of the entire parcel if more than 20% of it is infected. Currently there is no curative treatment for flavescence dorée; the only effective way to fight the diseases is close surveillance to limit its propagation. Controlling the disease today is based on laboratory screening of specimens taken from vineyards presenting symptoms. However, these latter only appear after at least a year of contamination. In all, the direct cost of the fight against flavescence dorée is estimated at €11 million, or €20 to €50 per hectare.

As a complement to the laboratory screening measures, Anova-Plus wishes to propose a tool for early diagnosis directly useable in the vineyard. Its new rapid test kit will permit not only the active participation of the viticulturist and thus a more effective fight against flavescence dorée, but also a better targeted use of pesticides and thus a more environmentally sound approach to preventing disease spread.

Coming soon: DNA testing in the vineyard

The new kit proposed by Anova-Plus is based on DNA detection. With this new technology, viticulturists will be able to

rapidly perform, without leaving the vineyard, a test that was previously available in the laboratory only. If the phytoplasma responsible for flavescence dorée is present in the sample, the test will multiply its DNA and make it known via a flow strip. The challenge for Anova-Plus was to create a test as easy as possible to perform, with no requirement for training in laboratory techniques, so that it becomes an indispensable decision-making tool that will accompany vineyard professionals in their daily tasks.

With only the final field validation remaining to be done, Anova-plus is hoping to make their new kit available to professionals in 2015.

Contact Anova-Plus: Carine La – carine.la@anova-plus.com – +33 (0)1 75 29 58 87

Genopole press contact: Véronique Le Boulc'h – veronique.leboulch@genopole.fr – +33 (0)1 60 87 44 98

About Anova-Plus. The innovative startup Anova-Plus was created in March 2012 and is today a Genopole-accredited company and member of the Vegepolys and the Scientipôle Croissance competitiveness clusters. With the experience of its founders in agriculture and aquaculture, Anova-Plus is focused on battling the propagation of agricultural and aquacultural pathogens through the development of affordable and field-useable rapid diagnostic tests. Currently, Anova-Plus is also developing a test strip-based kit to detect a toxic microalgae present in oysters and similar shellfish. www.anova-plus.fr

About Genopole. Genopole is the leading French biopark dedicated to research in genetics and biotechnologies for healthcare and the environment. Genopole unites 19 research laboratories, 80 biotech companies and 21 technical platforms as well as university training programs (Évry-Val-d'Essonne University). Its objectives are to favor the development of research in genomics, post-genomics and other related fields, assure the transfer of resulting technology to the industrial sector, establish academic-level training programs for these fields, and finally to create and support biotech companies. Genopole is funded mainly by the Ile-de-France Regional Council (30%), the Essonne Department Council (26.5%) and the French State (15.7%). www.genopole.fr