

# Innovation to preserve TRADITION

## THE EXAMPLE OF *fungi-resistant grape vine*

### 1 SUSTAINABILITY DUE TO REDUCED FUNGICIDE USE



Grape vines cover only 3% of the EU agricultural area

but are responsible for



With fungi-resistant grape varieties spraying could be reduced

**from 10-20 applications > to 2 or 3 per season.**

In addition it saves:

**60%-80% ECONOMIC COSTS\***

**40%-60% ENERGY COSTS\***

**60%-75% WATER CONSUMPTION**

\*depending on the region



### 2 PRESERVING TRADITION - *Crispr can save our traditional grapes like Sangiovese, Riesling or Merlot*

Growers and producers have optimized their production to certain grape vine varieties as consumers prefer **traditional varieties** from their region. By any cross-breeding the genetic **identity** of a traditional variety gets lost.

Plant breeding innovation, with the latest genome editing techniques, provides opportunities to change single characteristics (e.g. from wild relatives), like resistance to fungi **without losing the genetic identity of a variety**. A Sangiovese, Riesling or Pinot Noir "plus" can be developed with the typical taste in addition to fungi resistance.

**By cross-breeding the genetic identity of a traditional variety like Sangiovese gets lost - Gene editing can save it!**

### 3 EFFICIENCY OF GRAPE VINE BREEDING

Attempts to **introduce resistance genes by cross-breeding with wild relatives of the modern grape** have been successful.



From seedling to flowering it can take **3 years**



Taking into account cross-breeding, testing, and certifying, **the whole process of breeding** a new grape variety **can take as long as 25 to 30 years.**

This is due to the perennial nature of the grape vine and its long generation time. **Multiple back-crossings are needed to improve the wine quality and selection for good wine-making potential is extremely complex and costly.**



Producing new fungi-resistant grape varieties is therefore two-fold difficult. In addition to being resistant, the grapes also **need to produce a tasty wine that is marketable.**



**With the new genome editing tools we could be able to drink the first glass of wine from the tasty and fungi-resistant Crispr grapes in approximately 10 years time. Cheers!**

PROF. MICHELE MORGANTE

**Sangiovese**  
traditional taste & quality



Several steps of backcross breeding 25-30 years

**nameless grape variety**  
Resistant to fungal pathogens but different in appearance, quality and taste

**Wild Grape**  
poor taste & quality but fungi-resistant



**Sangiovese**  
great taste & quality



**Sangiovese "plus"**  
traditional taste & quality and fungi-resistant



Cheers!

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