FIRST AGRONOMIC EVALUATION OF TEN RESISTANT VINES IN THE ENVIRONMENT OF "CASTELLI ROMANI"

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INTRODUCTION

The increasing effort towards sustainable production techniques is expressed in various ways, also introducing in culture plant varieties selected to resist to the most serious diseases. In viticulture, for some decades now, we have spoken of vines downy mildew resistant (Plasmopara viticola) and powdery mildew-tolerant (Oidium tuckeri). Resistant vines are gaining interest all over the producing countries of the world. Some of these have been obtained and tested in northern environments, e.g. in Germany, Austria. In Italy they have spread in cold wine-growing areas of the northern regions, but not yet in the vineyards of the peninsular regions (Tomasi et al. 2014).

In spring 2016, the CREA - Centro di ricerca Viticoltura ed Enologia, based in Velletri (RM), together with ARSIAL, Agenzia Regionale per lo Sviluppo e l’Innovazione dell’ Agricoltura del Lazio, set up an experimental vineyard with ten cultivars of resistant vines. The aim of this work was to observe the agronomic behavior of these resistant vines, introduced in a south and warm environment, as “Castelli Romani”. The observation of viticultural characteristics and oenological aptitudes of the ten resistant vines is aimed at their registration in the Regional Register of vine varieties classified as suitable for production of wine grapes in Lazio Region. In 2018 the first harvest was carried out. In this work we report the agronomic results recorded in the period in relation to the seasonal trend.

MATERIALS AND METHODS

The tests were carried out in the experimental vineyard of CREA - Centro di ricerca Viticoltura ed Enologia, in Velletri (Rome), 41° 40.5’ N latitude 12° 50.7’ longitude E, at 355 m above sea level. The vineyard is located on a south facing soil. The vineyard formed by 12 rows of 80 vines (1 row per cultivar): 5 rows with 5 resistant white grapes and 5 rows with 5 black berry resistant vines. In the first row Trebbiano Toscano was planted, used as test for white grapes, while for black grapes the reference vine was Sangiovese, planted in the twelfth row. Plant distance: (1.0 m x 2.5 m), 4,000 vines per hectare; without definitive training system.

The first ten Italian resistant varieties were obtained by the collaboration between the University of Udine, the Institute of Applied Genomics and Vivai Cooperativi Rauscedo. VCR carried out the agronomic and oenological evaluation of these varieties, of which VCR is exclusive licensee. The activity of VCR has allowed the registration of these ten vines resistant to the National Catalog in 2015. These are Fleurtai, Soreli, Sauvignon Kretos, Sauvignon Nepis, Sauvignon Rytos, white grape varieties, Cabernet Eidos, Cabernet Volos, Merlot Kanthus, Merlot Khorus, Julius, black grape varieties (VCR, 2019).

Phenological observation had place every week. The most important phenological stages (inflorescence emergence, flowering, development, veraison and ripening of berries) were observed and defined by an international standard code BBCH (Stauss R., 1994), a centesimal phenological scale, based on coding system. Phenological events are considered to occur when, the 20% of the buds reach that phenological step. (Tab.1)

Meteorological data were collected by an agrometeorological station nearby the vineyard and belonged to ARSIAL (cod.RM10SPE). We considered daily values of meteorological variables: T max, Med, min, precipitation, air humidity (Fig. 2, Fig. 3).
RESULTS AND DISCUSSION

The vines subject of this study are considered resistant to downy mildew and powdery mildew tolerant. In spring 2018 the conditions for the inoculum of the downy mildew were verified, according to the 3 ten rules (10 mm of rain, 10 °C of temperature, length of the shoot of at least 10 cm). Some symptoms of downy mildew appeared on the leaves at first, then the plants contained the infection and passed the critical phase.
The meteorological conditions greatly affect the quality of the grapes and the vintage of the wine. The vine growing season in 2018 was characterized by a particularly rainy August (132.6 mm and 15 days of rain) and a constantly high relative humidity level (average 70%).
The white vines were earlier than Trebbiano Toscano, the reference cultivar, until the time of the 75th phase of the growing season (Fig. 1). Subsequently, however, in this first year of production, 3 out of 5 varieties did not complete the maturation process: the bunches of Fleurtai, have been eaten by wasps and birds that destroyed production by July 18, just before the softening phase (15 ° Bx); Sauvignon Nepis produced only about thirty bunches on 80 vines; Sauvignon Kretos at the end of June was struck by the powdery mildew that compromised its production. These three varieties were not vinified.

Soreli and Sauvignon Rytos, on the other hand, completed the ripening phase (89 BBCH = 18°Bx) a little earlier than Trebbiano Toscano.

All the black grapes vines completed the ripening of the grapes. Merlot Khorus and Merlot Kanthus, were earlier than Sangiovese (about 23 days), the reference grape. Cabernet Eidos, had a late development and reached maturity (89 BBCH = 20 °Bx) at the same time as Sangiovese; Cabernet Volos, instead, anticipated Sangiovese by about 20 days.

The Julius variety showed development phases coinciding with those of Trebbiano Toscano, but with a ten day advance on the harvest ripening stage.

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Dimension</th>
<th>Bunch</th>
<th>Weight (g)</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trebbiano Toscano</td>
<td>large</td>
<td>503.0±159.0</td>
<td></td>
<td>eaten by wasps and birds</td>
</tr>
<tr>
<td>Fleurtai</td>
<td>very loose bunch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soreli</td>
<td>medium and compact cluster</td>
<td>267.2±63.5</td>
<td></td>
<td>sensitive to powdery mildew</td>
</tr>
<tr>
<td>Sauvignon Kretos</td>
<td>middle-small</td>
<td></td>
<td></td>
<td>very poor production</td>
</tr>
<tr>
<td>Sauvignon Nepis</td>
<td>small</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sauvignon Rytos</td>
<td>small and compact</td>
<td>177.4±44.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cabernet Eidos</td>
<td>very loose</td>
<td>164.4±44.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cabernet Volos</td>
<td>straggly</td>
<td>167.5±30.1</td>
<td></td>
<td>sensitive to powdery mildew</td>
</tr>
<tr>
<td>Merlot Khorus</td>
<td>medium large sparse</td>
<td>182.4±48.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Merlot Kanthus</td>
<td>compact cluster</td>
<td>164.4±44.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Julius</td>
<td>medium-little loose</td>
<td>164.1±62.1</td>
<td></td>
<td>poor production</td>
</tr>
<tr>
<td>Sangiovese</td>
<td>medium</td>
<td>342.7±117.6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2 - Observed data on productivity
CONCLUSIONS

The adaptability of vines resistant to an environment allows sustainable viticulture to be practiced there, thanks to the reduction in the number of treatments required.
In the Castelli Romani, year 2018, the resistant vines were generally early, compared to the reference cultivars (Trebbiano Toscano and Sangiovese).

Productivity was compatible with the initial production phase; we can say, that black grape varieties were more promising than the white ones, allowing wine-making trials, with the exception of cv Julius. Only two of the five white grape varieties reached maturity and were vinified.
The conditions for the downy mildew inoculum occurred; but plants, although with some symptoms, generally show resistance.
Tolerance to powdery mildew and botrytis must instead be addressed because they constitute a criticality. These are the first results obtained, certainly not exhaustive.

The observation of these ten resistant varieties, typical of viticultural of cold environments, must continue in the coming years to assess their agronomic response and their oenological characteristics in the Castelli Romani area, before being entered in the regional register of authorized vines.
The goal, in fact, is to obtain resistant vines in the context of autochthonous or more widespread varieties in each wine-growing area, in order to have a greater agronomic affinity and certainly a greater economic interest. In this regard, CREA - Centro di ricerca Viticoltura ed Enologia has undertaken a selection work of resistant vines among the native or typical cultivars of Castelli Romani area: Cesanese d’Affile and Bellone.

References:
Vivai Cooperativi Rauscedo Quaderni tecnici VCR Le varietà resistenti alle malattie L’innovazione in Viticoltura 4^ Edizione 2019