

Oregon Wine Advisory Board Research Progress Report

1987

Pedicel Necrosis: Were Oregon Grapes Affected in 1986?

David Jordan
Oregon State University

Introduction

Pedicel necrosis is a grape disorder that is recorded in all the world's grape growing regions. Synonyms for similar disorders include stielahme (Germany, Switzerland), dessechement de la rafle (France), palo negro (Chile), shanking (New Zealand, Britain) and waterberry (USA). Pedicel necrosis can be a serious problem. Large reductions in yield and quality have been associated with this disorder in both wine and table grape vineyards.

In this brief article pedicel necrosis symptoms are described and a report is given on a survey of Oregon vineyards which showed there were very few affected clusters in 1986. Also, research on pedicel necrosis at Oregon State University is outlined.

Symptoms

Pedicel necrosis only affects the clusters. Affected clusters develop necrotic lesions in pedicel (berry stalk) and/or peduncle (cluster stalk or stem) tissue which result in withered berries in severely affected clusters. Symptoms become visible from veraison through to harvest.

Some skill or experience is required to give positive visual diagnosis. The necrosis or blackening often starts as a girdling or ring on a few pedicels. With time, in severely affected clusters, the necrosis spreads along the pedicels, more pedicels become affected and the peduncle can also develop necrotic strips (normally along the peduncle rather than around it). It is possible for the peduncle to be affected in clusters with very few pedicels showing symptoms.

Similar symptoms can often be observed on the stalk tissue of stored table grapes. Often the pedicels and peduncle are brown and dry while the berries remain turgid. When this is seen in the field before harvest it is called pedicel necrosis.

Care has to be taken to not confuse the symptoms of powdery mildew or botrytis infections with pedicel necrosis, a physiological disorder. Generally, presence of these two pathogens elsewhere in the cluster can establish if they are involved. Also, when pedicels become necrotic from a pathogenic infection the berries are affected first, often with a loss in turgidity, and **later** the pedicels become necrotic. Note, in the disorder pedicel necrosis the reverse sequence occurs - the pedicels are affected first and then much later the berries may lose turgidity.

Sunburn or heat stress can also cause withered berries and necrotic pedicels, but again the berries are affected first before the pedicels. Often these environmentally affected clusters are exposed and on the

exterior of the vine canopy whereas pedicel necrosis can occur anywhere in the canopy.

Suggested Causes

Many causes of pedicel necrosis have been suggested. Included are water, nutrient and plant hormone imbalances, soils high in organic matter, particular environment conditions and cropload. Some cultivars are more prone to being affected than others, so there is a genetic interaction. Cultivars that are most sensitive include 'Cabernet Sauvignon', 'Gewurztraminer', 'White Riesling', and some 'Muscats'.

The disorder has been extensively studied internationally. European research has concentrated on calcium (Ca), magnesium (Mg) and potassium (K) imbalances. Tissue high in Ca and/or Mg (naturally or induced with spray applications) is less affected than tissue low in these nutrients. Research in America, New Zealand and Chile has focused on the role of nitrogen (N). Vines high in N tend to have high incidence of pedicel necrosis. New theories suggest a possible interaction between Ca, Mg and N. If this is verified it will help clear some of the confusion that exists.

Recent information from Switzerland showed a strong correlation between temperature at flowering and the incidence of pedicel necrosis. Cold flowering temperatures increase the incidence whereas high temperatures decrease it. The environmental or seasonal influence seems to be larger than any effect from nutrient variation. How environment affects the vine to influence pedicel necrosis incidence is not known.

Oregon Vineyard Survey 1986

Pedicel necrosis incidence in Oregon was not known. Some growers thought they had affected clusters, but had not accurately recorded the incidence. In 1985 there were reports of some severely affected vineyards. The Wine Advisory Board allocated funds for a survey in 1986 to establish what levels of this disorder were present.

Vineyards in Douglas, Benton, Yamhill Washington and Linn counties were visited and visually scored for pedicel necrosis incidence. It was very difficult to find any affected clusters. The incidence was very low. The most severely affected vineyard had only about 1% of the clusters affected with other vineyards at much lower levels. Note, the affected clusters often had only a few affected berries, so there was little reduction in yield or quality. The conclusion: pedicel necrosis was not a problem in Oregon 1986.

Pedicel necrosis incidence can be greatly affected by season. Consequently, it is premature to suggest that pedicel necrosis will not be a problem in Oregon. Future seasons may show more severe incidence levels than experienced this last season.

OSU Pedicel Necrosis Research

Pedicel necrosis is being studied at OSU as part of the author's PhD project. Also, it is possible that a visiting scientist from Chile will be involved in this program later this year. The research program is based on a model experimental system that can be used to investigate the various activities of nutrients on symptom development. Early results show a link between symptom development and ammonium concentration. The primary goal of this programme is to improve our knowledge of cluster physiology and relate this to pedicel necrosis.

Conclusion

Pedicel necrosis is a disorder that many Oregon grape growers may not be familiar with, but can be a serious problem in many other grape growing regions. The name of this disorder describes the symptoms which develop after veraison. Severe symptoms result in total stalk tissue necrosis and ultimately withered berries, yield and quality reductions.

In 1986 Oregon vineyards had very low pedicel necrosis incidence and severity.