UNIVERSIDAD DE LA FRONTERA

Facultad de Ingeniería y Ciencias

Doctorado en Ciencias de Recursos Naturales

INTERCROPPING WITH SUBTERRANEAN CLOVER ON GRAPEVINE NUTRITION AND DEVELOPMENT IN A VOLCANIC SOIL.

DOCTORAL THESIS IN FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE DOCTOR OF SCIENCES IN NATURAL RESOURCES

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“"Intercropping with subterranean clover on grapevine nutrition and development in a volcanic soil"”

Esta tesis fue realizada bajo la supervisión de la directora de tesis, Dra. María de La Luz Mora del Nucleo Científico Tecnológico en Biorecursos de la Universidad de la Frontera y ha sido aprobada por los miembros de la comisión examinadora.

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Thesis summary

"As consequence of climate change, fruticulture is moving from central Chile to the southern regions where traditionally are grown cereals and pastures. In this study, we assessed the feasibility of introducing viticulture in volcanic soils of southern Chile in combination with a traditional pasture. We proposed to grow subterranean clover (Trifolium subterraneum L.) with grapevine (Vitis vinifera L.) in intercropping for improving grapevine nutrition and performance in volcanic soil.

The effect of intercropping between grapevine and subterranean clover on grapevine performance in pots using volcanic soil as a substrate, was assessed. The experiment was performed under controlled conditions in greenhouse growing plants in pots in monocropping and intercropping. The results showed that intercropping increases the accumulation of lignocellulosic compounds in the roots improving the exploration of the soil. Besides, intercropping improves soil characteristics such as the concentration of P in soil, the activity of acid phosphatase, and the reduction of soil acidity. There are differences in lignocellulosic compounds depending on the nutritional status of grapevine plants. Thus, intercropping appears as a promising tool to improve P use efficiency in volcanic soil, aiming to establish a sustainable system in agriculture"