

TABLE OF CONTENTS

Resumen	1
Abstract	2
CHAPTER 1. – General Introduction	3
1.1. General Introduction.....	6
1.2. Research objectives.....	7
1.2.1. General Objective.....	7
1.2.2. Specific objectives.....	7
CHAPTER 2. –Two later model	8
2.1. Validation of a two-layer model to estimate vineyard evapotranspiration by using meteorological data.....	9
2.2. Introduction.....	10
2.3. Theory.....	12
2.4. Material and Methods.....	13
2.4.1. General Description.....	13
2.4.2. Irrigation management and plant measurements.....	13
2.4.3. Energy balance measurements.....	15
2.4.4. Data quality control.....	16
2.4.5. Parameterization of available energy and resistances.....	17
2.4.6. Statistical analysis.....	22
2.5. Results and Discussion.....	22
2.6. Conclusions.....	28
2.7. Tables and Figures.....	30
CHAPTER 3. – Three layer model	38
3.1. Estimation of actual evapotranspiration for a drip-irrigated Merlot vineyard using a three-source model.....	39
3.2. Introduction.....	40
3.3. Material and Methods.....	42
3.3.1. Model description.....	42
3.3.2. Study site.....	47
3.3.3. Field measurements.....	48
3.3.4. Model performance.....	51
3.4. Results and Discussion.....	52
3.5. Conclusions.....	57
3.6. Tables and Figures.....	59

CHAPTER 4. – General Conclusions	72
4.1. General Conclusions.....	73
CHAPTER 5.- References	74
CHAPTER 6.- Appendix	83
6.1. Program to measure soil heat flux (datalogger CR1000).....	84
6.2. Program to measure to measure meteorological and micrometeorological variables (datalogger CR5000).....	88