Effect of soil temperature on grapevine vegetative growth and yield
Adapted by Alain Deloire, January 2020

What is the effect of soil temperature on grapevine vegetative growth and yield?

Part of the answer is provided by Field *et al*., 2020 (Am. J. Enol. Vitic. 71:1).

A greenhouse experimentation was used to apply cool (13°C) and warm (23°C) temperature to three-year-old Shiraz grapevines in pots, from budbreak to véraison with different temperature regimes from budbreak to flowering and flowering to veraison.

In a nutshell:

- Soil warming promoted shoot growth via utilization of starch reserves, while soil cooling promoted starch storage in both the root and wood,
- A change in soil temperature from warm to cool through flowering was also associated with reduced fruit set,
- Warm soil will induce more leaf photosynthesis and transpiration for the same vine water status,
- From budbreak to véraison, the shift from cool to warm caused a decrease in root starch to comparable levels in vines that had been grown continuously in the warm soil,
- Conversely, a switch from warm to cool resulted in an increase of root starch concentrations to levels similar to that of vines grown continuously in the cool soil.

Take home messages

- Soil temperature from budbreak to veraison matters, therefor inter row mulching, cover crop and soil preparation could impact on vine physiology and yield.

Stewart K. Field, Jason P. Smith, Erin N. Morrison, R.J. Neil Emery, and Bruno P. Holzapfel, 2020. Soil Temperature Prior to Veraison Alters Grapevine Carbon Partitioning, Xylem Sap Hormones, and Fruit Set. Am. J. Enol. Vitic. 71:1.

Figure 1: Example of root system in a sandy soil (Shiraz).