

Viticulture as a climate proxy for the Roman world: evidence and problems

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Chapter outline

Vine growing is highly sensitive to climate. Viticulture possibilities are especially linked to growing season temperatures, in particular for the period between April and August (late spring to mid-summer). Temperatures are a major factor in determining the boundaries of regions suitable for viticulture, and significantly impact grapevine phenology throughout the full cycle of development. In turn, wine grape phenology is intrinsically linked to the timing of grape maturation, and thus to the date of the grape harvest. So basically, higher temperatures allow for the expansion of vineyards towards higher elevations and into more northern areas, and accelerate fruit maturation and advance grape harvest dates (GHD). Colder temperatures have the opposite effect. This means that the geographical location of vineyards and annual grape harvest records can be proxies for temperature variations. Herein lies the link between viticulture and past climate reconstruction.

In this chapter, we examine the potential of viticulture as a proxy for climate reconstruction in the Roman world. Several studies have successfully used historical grape harvest time series for studying climate evolution in Medieval and Early Modern Western Europe. Unfortunately, such precise and secure documentary data are unavailable for the Roman era, for which all textual information on viticulture is narrative or descriptive in nature, containing at most some numeral titbits. This is a serious obstacle. Nevertheless, we argue that systematically bringing together all documentary evidence with potential climatic value can still be of importance for detecting climatic variations on wider temporal and/or spatial scales within the Roman world.

To this purpose, we will look at three types of datasets: **archaeological data** (vineyard traces and press remains at higher altitudes, or in areas outside the direct sphere of the Mediterranean climate region; that is, specifically in the more northern areas of the Western Roman Empire; e.g. archaeology now unequivocally shows that viticulture was very well possible in southern Britain from the 2nd century AD onwards); **textual sources** (in particular the manuals by the ancient agronomists, but also written calendars and legal texts; in the latter case, annual Nile flood records can be of special importance, as they coincided with the period of the grape harvest in Egypt); and **iconography** (rustic calendars or seasonal representations on mosaics, frescoes and stone reliefs; especially with regard to the months of August, September and October). In our examination of these datasets, we focus on three types of information that may be interpreted climatically: mainly vineyard/press location (1) and grape harvest periods (2), but also wine quality (3), as the latter can be affected by temperatures in the months preceding the harvest (mostly influencing the sugar/acidity balance in the grapes).

Our discussion focuses on the critical evaluation of the assembled datasets as climatic proxies for the Roman world, taking into account their strengths and weaknesses (e.g. representative value and their possible dependence on other factors than climate, such as cultivation techniques, the use of certain grape varieties, the types of wines that were commonly produced, or other socio-cultural practices). As such, we intend to evaluate to which extent – if any at all – these datasets hold promise for informing future climatic reconstructions.