1. Introduction

To supply in the growing demand for their wine, Rustenberg needs to expand their vineyards.

An area on the farm (Area 1 in Figure 1) was identified and a soil study was done by Nico Wasserfall in March 2018. The resultant soil map is shown as Figure 2 and indicate that the soils in this area have medium to low potential for producing quality wines – 82% of the area studied.

The main reasons for the low potential were that the soils are very shallow and the compact clays in the subsoil would severely restrict root growth. The vines would consequently rely heavily on irrigation as the shallow root zone would not be able to store enough water to support the vines and their crop during the season. This would put pressure on the water balance of the farm as a whole, as the other vineyards are all irrigated supplementary. The development would thus not be possible as vineyards on these soils would require much more water to ensure good quality grapes.

In the current and probable prevailing water scarce conditions, optimizing water use is of primary importance. Therefore, soils should be selected that can store winter rain water and allow the development of deep rooting systems to support the vines during the growing season. Thus, limiting the requirement for irrigation. A well-developed deep root system buffers a plant against climatic variations and in the case of vines ensures a good quality crop. In search of high potential soils, as is the case for most of the vineyards on the rest of the farm, an additional area was identified, and this soil study was conducted.

Figure 1. Google Earth Image showing the areas studied and the position of the soil pits.

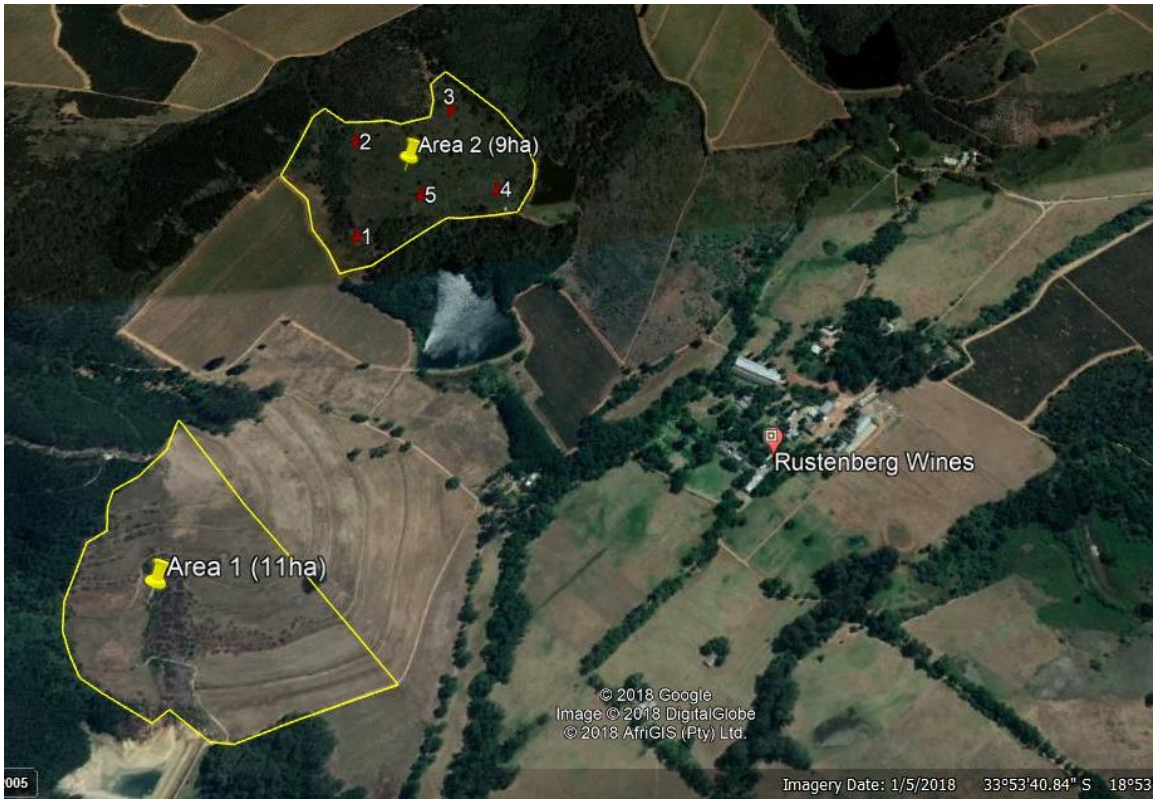
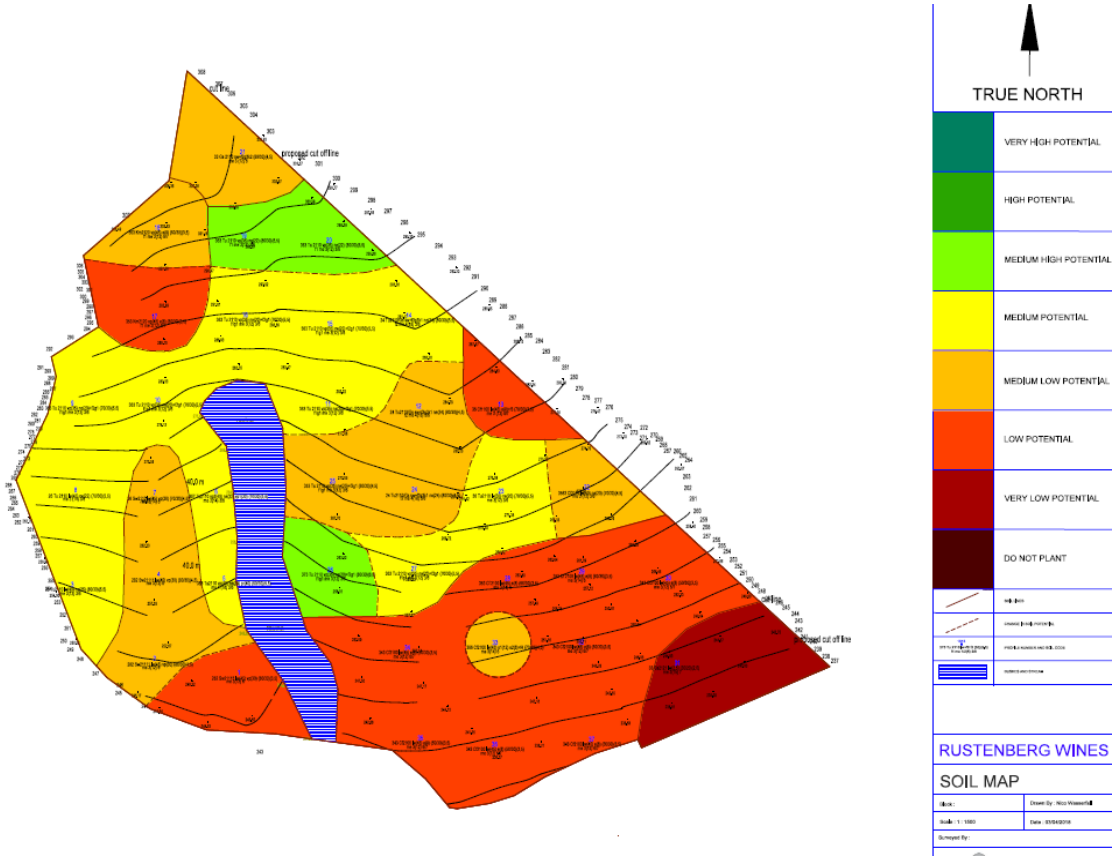


Figure 2. Soil Map of Area 1 by Nico Wasserfall



2. Soil Study Area 2

Profile holes were dug to a depth of 1,2m and the soils were classified according to the South African Soil Classification system. The positions of the holes are indicated in Figure 1.

The soil in the area is very uniform and all the profiles were classified as Oakleaf soil forms (Figure 3 below) – Orthic A / neocutanic B horizon. Neocutanic horizons are ideal for root development. It provides an aerated, well-draining medium that is also favorable for a healthy microbial life.

This is very high potential soils for the cultivation of vines. Vineyards on these soils would require minimum inputs in terms of nutrition and irrigation would only be supplementary.

The depth of the orthic A topsoil varies between 20 – 30 cm, and has a clay content of 10%

In all profiles the depth of the neocutanic B horizon extended deeper than 1m and had a clay content of 15 – 20%. Stones were absent and there were no physical barriers to root development. The relatively high clay content ensures that the subsoil can act as an effective reservoir to store the winter rainwater to be used by the vines during the growing season.

Before the establishment of the vineyards, soil samples must be taken for chemical analyses so that the lime and phosphorus requirement of the soils can be determined. These applications need to be done at soil preparation.

Figure 3. Soil profiles from pits in Area 2.

	Orthic A	
	Neucutanic B	
Profile 1	Oakleaf Soil Form	Profile 3

3. Declaration of Independence

Benjamin Johannes Diedericks, holds a Hons. B.Sc. Agric (Soil Science) degree and has more than 30 years of practical experience in agriculture in the fields of fertilization, composting, cultivation and product development.

I am an independent consultant and have no vested interests with any of the parties involved in this report.

BJ Diedericks
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