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Agricultural Report

Lot 22, DP 791884
Palmers Lane, Pokolbin

A site inspection of Lot 22, DP791884 Palmers Lane, Pokolbin was conducted on 8th February 2018

The property is currently a grazing property, relying on low productivity native and natural pastures. Productivity levels are low and there has been little improvement to the soils or pastures. The land has not been cultivated due to the shallow soils, low fertility and the potential soil structural damage when disturbed.

The land is of low productivity, with a saline drainage line dissecting the property and poor soil types with rocky outcrops on the higher slopes.

The land has been partially cleared for grazing, with some natural woodland and regrowth on shallow soils where there are some rock outcrops. Sheet erosion has occurred on some of the sloping land where soil cover is poor and the soils hard-setting and lacking organic matter.

The existing vegetation provides an indication of the potential productivity of the land. Along the drainage lines salt tolerant species are common indicating saline drainage, while the degraded natural pastures indicate poor fertility and low productivity.

The property is has soils that are marginal for most agricultural crops. While many of the soil constraints can be ameliorated, it not only increases the cost of growing agricultural crops but also increases the management requirements.

No access to irrigation water limits the potential of the property for horticultural production, as does the saline drainage line.

The land is considered Class IV and V land capability (Soil Conservation Classification), the agricultural production capacity being incapable of regular cultivation due to soil and landscape limitations.

Agricultural Productivity Potential

This land has a low potential productivity for agriculture. The low natural fertility of soils in the area and their structural problems require considerable inputs to ameliorate. Cultivation and disturbance of these soils needs to be limited due to erosion risks and salinity issues in the drainage lines.

The land does not have access to irrigation water, limiting the production options available and the productive capacity of the property.

Grazing has been the traditional agricultural land use, as it can be conducted with the least disturbance of the soils and environment.

The existing pasture is comprised of native and naturalised exotic species. These include many species that are tolerant of low fertility which have some salinity tolerance. Wiregrass, Native Parramatta grass, barb-wire grass and carpet grass are major components of the pastures. These are considered low quality species and sustain low productivity levels.

The low fertility of the soils prevents to growth of more productive species. Grazing options are limited to production that can support growth but rarely fatten stock. Growing steers or breeding weaners are common beef cattle enterprises in the area.

Vegetation

Mainly cleared for grazing purposes, the existing pastures are degraded natural pastures of low productivity. Areas of uncleared vegetation and re-growth occur in the upper slopes where rocky outcrops occur and the soils are shallow. Some erosion occurs in those areas due to low ground cover and the hard setting characteristics of the soil types. In some areas the humic topsoil has been lost due to sheet erosion leaving poor ground cover and sparse pasture growth.

The native woodland is mostly spotted gum, stringy-bark and iron bark. Paperbarks occur in the drainage lines where the soil remains wet for much of the year.

On the slopes a woodland of spotted gum, ironbark and stringy bark is predominant with a sparse understory of native grasses (predominantly wiregrass, slender rat’s tail and barb wire grass). Few forbs grow as an understory, other than some prickly wattle, Australian Blackthorn and weeds such as paddy’s lucerne and flat weed.

Photo: Regrowth of spotted gum, Iron Bark on the shallow soils where rocky outcrops occur.

Ground cover is poor in many areas due to the low soil fertility, poor soil structure and low organic matter levels.

The vegetation in the drainage lines is dominated by weeds such as spiny rush (*Juncus acutus*), Casuarina's and Melaleuca spp, all of which are indicators of salinity and waterlogging.

Photo: Spiny rush (*Juncus acutus*) growing along drainage lines. This is an exotic weed that colonises in highly saline situations were drainage is poor.

Landscape

The land comprises undulating and with a low hill with shallow podzolic soils on slopes and poorly drained yellow solodic soils on lower slopes, adjoining the drainage lines.
Soil salinity is often high in these drainage lines, evidenced by the strong growth of spiny rush and other saline tolerant plants. Disturbance of these areas for agriculture is to be discouraged due to the salinity levels in these soils.

The drainage lines are periodically waterlogged, limiting their use for agricultural and horticultural crops.

Photo: A significant drainage line dissects the property. Casuarina sp. and some Stringybark growing along this drainage line help maintain its stability.

Land Capability Classification

Land Capability Classification (Soil Conservation Service NSW*)
The land is classified as capability classes IV and V.

Class IV:

> Land not capable of cultivation on a regular basis owing to considerable limitations including; soil erosion, shallowness, rockiness and saline drainage lines. Agricultural production often limited to grazing with minimal disturbance and low productivity.

Class V:

> Land not capable of cultivation on a regular basis owing to increasing limitations to production and sustainability including; soil erosion, shallowness, rockiness and saline drainage lines. Few agricultural production options due to the physical limitations and soil disturbance best limited to prevent erosion and degradation.

The capability of the land for agricultural production is largely dependent on soil depth and soil fertility. Shallow rocky outcrops are a limitation and provide a restraint to yield. The saline drainage line, which meanders through the property, is also a restraint to production.

Photo: Where the soil is hard-setting and rocky outcrops occur, ground cover is poor and the land of low productivity.

Soil Characteristics

Inspection of the property and previous mapping by the Soil Conservation Service, NSW (Kovak and Laurie, 1991) of the Rothbury Landscape, indicates that the major soil types on the property comprise Yellow Podzolics on the slopes and Yellow Solodic Soils on the lower slopes.

The characteristics of these soils (see below) are not conducive to productive agricultural production. Considerable amelioration is required to bring these soils to some productive status and structurally they are at best limited to irregular cultivation.

They have low fertility status and their poor structure and imperfect drainage limits the number of crops that can be successfully grown. The inputs required often exceeds the value of the production achieved. These are marginal soils for any agricultural other than grazing (at a relatively low production level).

Mid Slope: Yellow Podzolic Soils

These soils are mostly hard-setting topsoils with weak structure and imperfect drainage making them not suitable to regular cultivation.

Soil Characteristics – Mid Slopes	
Soil Descriptions	Yellow Podzolics
Land Capability Classification	IV- V (suited to irregular cultivation)
Topsoil	Grey-Brown clay loams
Subsoil	Medium sandy Clay (Mottled)
Surface Condition	Hardsetting
Drainage	Imperfectly Drained
Soil Permeability	Moderately permeable
Available Water Holding Capacity	Moderate
Fertility (chemical)	Low -Moderate
Erodability	Moderate
Structural Degradation Hazard	Moderate

Lower Slopes: Yellow Solodic Soils

Occurring on the lower slopes of the landscape, tthese soils are generally of poor structure with low nutrient reserves.

They are often waterlogged. Mottling is common in the clay subsoil's indicating imperfect drainage. The subsoil's are generally moderately to slightly acidic, with poor calcium/magnesium balance. The mottled clays are often poorly structured which creates limitations to drainage and root growth down the soil profile.

They are only slowly permeable and can be moderately to highly saline. The salinity in the drainage line occurs as a result.

Soil Characteristics - Lower Slopes	
Soil Descriptions	Yellow Solodic Soils
Land Capability Classification	IV, V (not suited to repeated cultivation)
Topsoil	Yellowish – Brown Loams – Clay Loams
Subsoil	Medium Clay (Mottled)
Surface Condition	Hardsetting
Drainage	Poor Internal Drainage/Depends on Slopes
Soil Permeability	Slowly permeable
Available Water Holding Capacity	Moderate - high
Fertility (chemical)	Low
Erodability	High
Structural Degradation Hazard	High

Photo: Previous sheet erosion combined with the hard-setting soil has limited the ground cover and pasture growth in some areas of the property. The Soil types are considered to have moderate to high erodibility.

This property has limited areas suited to the growth of agricultural crops. The landscape and soils have limitations to the commercial agricultural production. The low quality soils and the drainage line that dissects the landscape limit the area that could be utilised for the growth of crops.

References:

Emery, K.A.(1997), *Rural Land Capability Mapping*, Soil Conservation Service of NSW.

Kovak, M and Lawrie J.W. (1991). *Soil Landscapes of the Singleton 1:250,000 Sheet*. Soil Conservation Service of NSW.

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