Onion growing in Tasmania

Suitability factors for assisting in site selection

Soil

Soil type and drainage are interrelated factors that strongly affect a site's suitability for onion (*Allium cepa*) growing. Onions grow best on well drained soils and so well drained soils (Ferrosols and Dermosols) are well suited and moderately well drained clay loams are suitable. Sandy loams (Chromosols, Kurosols, Sodosols) with topsoils greater than 20cm deep are marginally suited but those that have shallow topsoils (<20cm deep) are classed as unsuitable. Excessively drained loamy sands (Tenosols) are also well suited for onion growing. Imperfectly drained soils and black cracking clays (Vertosols) are marginally suitable or unsuitable and poorly drained soils (Hydrosols) are unsuitable. Site drainage can be improved with surface drains, raised beds or underground drains.

Topsoil pH was subdivided according to whether soil pH in water was less than 5.8, between 5.8 and 6.0 or greater than 6.0. Site suitability increases with increasing soil pH. Soil acidity can be corrected with the application of lime or dolomite.

The amount of cobble sized stones and rocks (> 60mm diameter) in the soil affects the ease of seedbed preparation, the harvesting rate and the wear and tear on machinery. Consequently, suitability classes based on soil stone content were: less than 2%, 2 to 10%, and greater than 10%. On some sites, the stones can be sorted and removed thus improving suitability for onion growing.

The concentrations of the available cations calcium and magnesium are important to ensure a successful onion crop. Sites with less than 2000 ppm exchangeable calcium or less than 120 ppm exchangeable magnesium are classed as unsuitable.

Soil salinity can have a detrimental impact on crop yield and long term sustainability. Salinity, as measured by electrical conductivity of a saturated extract (ECse), was used to assess soil suitability. Classes were assigned according to whether soils had ECse less than 2 dS/m, 2 to 4 dS/m, or greater than 4 dS/m.

Landscape and paddock factors

Factors associated with the landscape and paddock including site slope, truck access and disease and management history all contribute to the suitability of a particular site for onion growing.

The steepness of the land affects the risk of soil erosion, ease of machinery use and safety of paddock operations. Suitability classes were subdivided according to slope: flat – 5% slope, 5 – 10% slope, 10 – 20% slope, and greater than 20% slope. Erosion control measures such as mulched rip lines should be used to minimise soil erosion. Moderate to severe side slope creates occupational health and safety issues for operators of harvesting equipment.
Climate

Climatic factors are important in determining site suitability for the growing of a successful onion crop, including: risk of frost at key growth stages, growing season temperature, temperature during harvest, and rainfall during harvest.

Frost risk for autumn sown onions was assessed by assessing the chances of frosts of different severity during June or July. Chances of a) less than one year in 10, b) between one year in 10 and one year in 5, c) between one year in 5 and three years in 10, and d) more than three years in 10 were assigned to different suitability classes. The risk of frost in November was also assessed as this can cause ‘bolting’ (running to seed) in onions.

Optimum harvest conditions occur when mean daily maximum temperatures during January or February are less than 31°C and sites with consistently higher temperatures are considered less suited to onion growing.

Onions are grown in Tasmania with the use of supplementary irrigation. Rainfall aids in the economic production of crops but the likelihood of more than 5mm of daily rainfall on three or more days in any 7 day period during harvest (January – March) will reduce site suitability.

Factors not considered in the analysis:

The total area of crop grown in a district and the distance to the processing factory can affect the logistics for contractors and cartage costs, and so influence the viability of onion cropping in a particular district.

Developing rules to guide enterprise suitability mapping

Many plants require particular climatic and land characteristics for best performance. Frost, winter chilling, summer heat, drainage, slope and salinity are some of these characteristics. For each enterprise mapped by the Department of Primary Industries, Parks, Water and Environment (DPIPWE), the Tasmanian Institute of Agriculture (TIA) consulted industry experts and reference material to define land and climate “rules” that distinguish suitable from less suitable areas. These rules define the boundaries between the different classes of the enterprise suitability maps.

Suitability classes used are well suited, suitable, marginally suitable and unsuitable. Any limiting factors are also identified to guide the management practices that could help to overcome the limitations.

Landowners and potential investors are able to access comprehensive soil, climate, crop and enterprise information plus complementary farm business planning tools at:


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