



Sloping sites can be difficult to traverse and may require expensive earthworks to provide vehicle access, or for building sites.

Aspect

For crop production, choose sites for maximum sunlight hours and for protection from prevailing winds.

Soil

Soil characteristics play a major part in the success of both pasture and crop production. Contact the local Department of Agriculture, Land Management or similar body to discuss any potential problems (e.g., salinity, erosion, etc.) of targeted properties.

Factors to consider include:

- *Nutrient levels.* Many soils, particularly those that have been used previously for agricultural purposes, may be deficient in some nutrient elements. This can often be rectified by fertiliser application. It can be quite expensive, however, to do this when large scale production is planned. Soils that have a high initial fertility will save time and money. In rare cases, soils may have toxic levels of some nutrients that can damage or even kill plants. Tests should be carried out to determine nutrient levels prior to land purchase, to see if they are suitable.



A fertile, friable red loam. This soil drains well and is suitable for a wide variety of farming applications

- *Soil structure.* A well structured soil will have a crumbly, friable structure that is easily cultivated. Well structured soils have good aeration and good drainage, and can be readily penetrated by plant roots. Soil structure can be improved by the addition of materials such as lime, gypsum and organic matter. Soils that have good structure to begin with, will enable you to commence production earlier, and will be easier to maintain in good condition.
- *pH.* The degree of acidity or alkalinity of a soil is critical to maintaining the health of pasture and other crop plants, thus maximising production. Each type of plant has a preferred pH range. Most will grow quite successfully in the 5.5 to 7.0 pH range. Some may prefer slightly more alkaline conditions (above pH 7). When soil pH is not far out of the preferred range it can be modified fairly easily using acidifying materials such as superphosphate or ammonium sulphate fertilisers to lower pH, or alkalising materials such as lime to raise pH. Soils that have very low or very high pH conditions should be avoided. These are often very hard to modify or maintain to a suitable pH range. Soil pH can be easily and quickly measured using a simple test kit or pH meter.
- *Salinity.* Increasing salinity of both land and water is a problem in many countries. Soils for crop production should have low salinity levels. Alternatively, crops that are tolerant of saline conditions may be necessary.

Drainage

This includes both infiltration into the soil, and surface runoff. How much surface runoff is there, and where does it run to? Speak with neighbours! Consider all parts of the property. Are any areas prone to flooding? The presence of moisture-loving plants, such as rushes found in an open paddock, will give an indication of areas that tend to remain moist. If possible try and visit any properties you are considering purchasing during, or as soon as possible after, a heavy downpour to help determine any drainage problems.

CLIMATE

All plants and animals are adapted to particular climatic conditions. To get the best out of them in terms of both quantity and quality, you need to choose a site that provides conditions best suited to the particular plants and/or animals you are managing. If you already have a site, select plants and/or animals that suit that site. Modification of the site, such as building dams to provide additional water for irrigation, or growing windbreaks for shelter, may make it more suitable for the plants and/or animals you wish to manage.

Climatic data for an area is often available. The Meteorology office provides climatic data in a variety of forms for most of the country, that can be easily used to determine growing conditions in most areas.

Temperature

All plants have a range of temperatures in which they will grow. Within this range is an optimum range where the plants will give their best results. For example a particular plant may grow within the range 4-35° C with an optimum range of 15-25° C. Maximum temperatures at a potential site are generally not as critical as minimum temperatures. At high temperatures, plants may slow their growth to reduce water loss, whereas at low temperatures the plants may cease growth or even die. As temperatures can vary quite significantly, not only from season to season but also from day to night, it is important to consider the annual temperature cycle for each potential farm site. Tables or maps that indicate the average maximum and minimum temperatures for each month can be used to determine the potential growing season for different plants at that site.

As with plants, animals also are adapted to certain climatic conditions. For example there are cattle breeds that are better suited to warm climates, and ones that are better suited to cooler areas. It is far easier to select animals that are suited to your local climatic conditions than to try and modify your property to suit the animals you wish to grow. Simply driving around the area and seeing which crops and animals are thriving, or talking to local farmers, can give you a good indication of what to grow yourself.

Frosts

Frosts can cause major damage to plants. Plants which have been recently removed from protected conditions, such as in a greenhouse, and have not had enough time to 'harden up' are prone to damage by frost.

Many fruit crops are also susceptible. Frost frequency depends on location and on local topography. Frost conditions are most likely to occur on clear cold nights with little or no wind, at inland sites or at higher altitudes. It is least likely to occur in slightly elevated coastal areas, particularly where it is windy. The likelihood of frost occurrence can be established from climatic records, and from talking to locals.

Rainfall

A major limiting factor determining what plants or animals can be managed on a particular site is the rainfall the site receives. Low rainfall can be offset by irrigation from alternative sources of water. If these sources are not available, or the quality is poor, or if the cost to supply the irrigation water is prohibitive, then you need to choose a site that provides sufficient natural rainfall. There are four major points to consider regarding rainfall. These are:

- *Distribution.* This refers to when the rain falls. 25 mm of rainfall in a normally moist site during winter conditions will not have the same significance as the same amount falling in a normally drier site, or in summer.
- *Variability.* Some areas have a very consistent rainfall, others do not. Two sites may have the same average annual rainfall, but there may be quite different variation around that average at each site. For example, each site may have an average annual rainfall of 600 mm, but one may vary between 250 and 1000 mm from year to year, while the other may only vary between 500 and 750 mm from year to year. This has important consequences in determining what crops or animals to choose.

- *Frequency*. This is a measure of how often it rains, and can be important in determining the size of water storages facilities. For example, where there is a large interval between periods of rain, the water storages will have to be larger than for sites where rain falls frequently.
- *Intensity*. This is the total annual rainfall divided by the number of wet days (days exceeding 0.2 mm of rain). This is very important in terms of runoff. In areas of high intensity rainfall, runoff is generally high, and consequently the percentage of water infiltrating into the soil is low in comparison to areas with low intensity rainfall. Erosion can be a major problem in high intensity rainfall areas, while getting sufficient runoff to boost water storages can be a problem in low intensity areas.

Evaporation

Evaporation is the loss of water as water vapour. It increases as temperatures increase, humidity drops and winds increase. It can be measured by determining the amount of water evaporated from a free water surface exposed in a pan. In countries, where surface water storage is extremely important for agricultural purposes, evaporation is very significant. As with other climatic data, maps or tables of evaporation data are generally readily available.

Effective Rainfall

Perhaps the most important climatic parameter that determines the growing season for crops and pasture at a particular site is 'Effective Rainfall'. This can be defined as the rainfall over a certain period, such as one month, minus the soil evaporation (equivalent to approximately one-third of pan evaporation figures) during the same period. A positive figure indicates that soil moisture is increasing, or in other words the amount of rainfall received in that period exceeded the amount of water lost by evaporation. A negative figure indicates that evaporation has exceeded rainfall and that the soil is drying up. The number of months in succession in which rainfall exceeds evaporation (as long as temperature isn't a limiting factor) determines the growing season of a particular site.

Wind

Wind is important in a number of ways. The stronger the wind the greater the amount of evaporation. Vegetation and soils will dry out more quickly, water storages will be reduced.