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INNOVATIVE HORTICULTURE

A Guide to Olive Variety Selection

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As growing olives is a long term venture, it is essential that growers give serious consideration to the selection of olive varieties for their grove.

Essentially varieties must be adaptable to the local climate, high yielding and capable of producing a type of oil or fruit that will have a high demand in the market place.

As the olive industry is relatively new in Australia there is very limited information regarding the performance of olive varieties throughout the different growing regions of the country.

To make an informed decision regarding variety selection it is recommended that advice is sought from local growers / grower associations, consultants, DPI and nurseries. Growers, however, must be careful to distinguish between information based on proven observations and reliable data and that which is unsubstantiated perceptions and opinions.

Two of the main criteria for variety selection in Australia include:

- Final product / market demand
- Climate

Other varietal factors that are beyond the scope of this guide but need to be considered by the grower include: insect and disease resistance, mechanical harvest suitability, oil characteristics, growth habit, tree vigour / row spacing, cross-pollination, precocity and ripening time.

Final product / market demand

The final product should reflect the demands of local and/or export markets. It is important that growers undertake research to determine which varieties and products are preferred by the processor/market intended to be supplied and to work back from this point.

Initially, growers must decide whether they want to produce olives for table fruit or for oil.

In general, most table fruit varieties have a low oil content and are not suited for commercial oil extraction. On the other hand, most oil varieties can be used as table fruit but because the fruit size of most oil varieties is relatively small, their use as table fruit on a commercial scale is usually limited.

The oil varieties: Arbequina, Barnea, Coratina, Correggiola, Frantoio, Koroneiki, Leccino and Picual contain a high percentage of quality oil and are the most commonly selected for Australian groves specialising in olive oil production.

If the grower decides on table fruit production then varieties are chosen by their yield, size of fruit and suitability for commercial processing methods. Commercial table fruit processing is most efficient if the variety has a flesh-to-pit ratio greater than 6:1 (ie 6 parts flesh to 1 part pit), and the flesh has a firm texture.

If black table olives are the desired product then the grower must also look for a variety with a relatively even ripening stage for the majority of the crop. The other option is to process green olives using sodium hydroxide lye processing to artificially turn the olives black.

Varieties such as: Barouni, Hojiblanca, Kalamata Manzanillo, Picholine, UC13A6, and Volos are all known for their excellent textures and flavours when processed as table olives. Manzanillo is grown widely throughout California and Southern Spain and would be regarded as one of the world's most important table fruit varieties.

Climate

Due to the olive tree's hardiness and adaptability, most olive varieties can survive a wide range of climatic conditions. They have the ability to withstand drought and physical damage which would cause serious decline of many other fruit trees.

It must be noted, however, that although olives will often survive under harsh climatic conditions, fruit yield will be poor. From a commercial point of view, suitable climate conditions are essential for economic viability.

Traditionally, the major olive growing regions throughout the world are found in Mediterranean type climates that are characterized by a winter rainfall pattern, mild winter temperatures and hot dry summers. A Mediterranean climate is one that resembles those of the lands bordering the Mediterranean Sea. These climates generally occur on the western coasts of continental landmasses, roughly between the latitudes of 30° and 45° north and south of the equator.

The following list divides Australia's most commonly planted varieties into three climatic categories based primarily around temperature. Although variables such as rainfall seasons and soil types can affect individual varieties in different ways, at this

stage little is known of these specific variety /environment effects under Australian conditions.

In general, all olive varieties require winter rainfall or supplementary irrigation through the winter for reliable fruit set.

Some varieties will crop well in a range of climates and are listed as such below. This list is based on both Australian and international research available to date but cannot be considered conclusive as some of the varieties have not been trialed in all climates (varieties alphabetically listed).

Cold Climates: areas where temperatures can fall below -6°C and snow may fall occasionally.

Olive groves may be unviable in these colder climates without the use of costly frost protection equipment. Severe frost damage can be fatal to young olive trees.

Growers should be fully aware of the locality's climatic data and carefully consider the risk before planting into an area that is subject to severe frosts.

In colder regions generally only oil olives are grown as the fruit is less prone to heavy frost damage and with oil varieties the harvest window can be more flexible. Areas that have a high probability of early frosts around harvest time should be avoided.

A brief International Olive Oil Council summary of the cold hardiness of mature olive trees as follows.

A mature olive tree can withstand low temperatures of -8°C to -10°C as long as it is not subjected to them for many hours, thawing proceeds slowly and the tree is not in an active growing period. Low temperatures can cause damage to fruit, shoots and secondary branches, and even to the scaffold branches and trunk. To ensure it fruits well, the olive does, however, require temperatures close to zero to induce floral initiation. It_{2/3}

withstands high summer temperatures well, and even lack of ground moisture, although it then adjusts its growing activity to an essential minimum.

The level of frost hardiness in the olive tree is an genetic trait that varies amongst varieties. In Australia, the varieties most commonly selected for these cold climates include: Arbequina, Coratina, Leccino, Hojiblanca, Picual and Volos.

Moderate Climates : areas where minimum winter temperatures are generally - 3°C to - 4°C and very rarely go below - 5°C. Such areas are considered to be typical of the world's olive growing regions. These areas provide the necessary winter chill requirements for optimal flower initiation and development without being so cold as to possibly damage any late season crop.

Most varieties available in Australia are performing well in these areas. They include: Arbequina, Barnea, Barouni, Coratina, Correggiola, Frantoio, Hojiblanca, Jumbo Kalamata, Kalamata, Koroneiki, Leccino, Manzanillo, Pendolino, Picholine, Picual, Sevillano, UC13A6, and Verdale.

Warm Climates: these have been divided into two sections: Warm Mediterranean type climates and Warm subtropical summer rainfall climates.

Warm Mediterranean climates of southern Australia (mainly winter rainfall and hot dry summers) : areas which have an average daily temperature in July of 12°C or less but rarely frost or fall below 0 to - 2°C but are subject to a traditional Mediterranean winter rainfall pattern. These areas are typically located along the coast of southern Australia and are generally reliable olive producing areas.

The varieties that generally perform well in these climates include: Arbequina, Barnea, Barouni, Correggiola, Coratina, Frantoio,

Jumbo Kalamata, Kalamata, Koroneiki, Manzanillo and Picual.

Warm subtropical, summer rainfall climates of Northern NSW and QLD: areas that rarely frost or fall below 0 to - 2°C but are usually subject to a warm dry winter and spring .

Commercial olive groves in this type of subtropical climate can be marginal as there may not be enough winter chilling for optimal flower initiation processes. Warm temperatures and hot dry winds during spring flowering can also be problematic. Correct variety selection for these warm climates is critical.

Some research work evaluating the performance of olive varieties in a warm winter, summer rainfall climate has been undertaken in Australia. Preliminary data from this trial suggests that the varieties which look most promising for warm winter areas include: Arbequina, Arecuzzo, Barnea, Del Morocco, Koroneiki, Manzanillo and Picual.

Please note: growers who intend to plant olives in a warm climate, outside of the traditional climatic zones should regard the initial planting as a trial and not a commercial venture until varietal performance is proven. In most cases, the recommended varieties will bear some fruit but reliable commercial yields may be difficult to obtain.