It was considered that too much had gone into the production of the flowers to make it worth while growing the bulbs on.

The same conditions are found to some extent where tulips are grown in the warmer parts of this country, especially if the flowers are cut. When tulips are planted in a hot, dry soil little root development or none takes place and bulbs remain almost as if they were in storage. Instead of the roots forming first, the shoot may grow, drawing nourishment from the bulb only. Flowering that year may not be greatly affected, but bulb development will be unsatisfactory, often resulting in "breaking up of the bulbs"; that is, the formation of a number of small bulbs none of which is of flowering size.

Soil Requirements and Site

One of the most important requirements for tulip growing is a well-drained soil with a good water-holding capacity. In Holland the tulip fields are mostly a light loam of a sandy nature, with a permanent water-table at a depth of about 2ft. In such a soil tulips can be lifted with a good, clean skin which makes them a more attractive selling line, though the outer skin is not usually an indicator of the quality of the bulb.

Tulips can be grown satisfactorily in most soils provided they have been suitably prepared. A rich soil is not necessary, but a good lime content is essential. Very heavy soils are not desirable, as the lifting of the bulbs would be most difficult, especially under drought conditions which are experienced sometimes at that time of the year.

Crop rotation should be carried out to ensure that no disease is carried over in the soil and also to keep the varieties true to name. Some bulbs will invariably be missed during lifting and would create a problem if the field were used for tulips the following year.

Bulbs are often grown in New Zealand as one of the crops in mixed farming, and provided adequate attention and labour can be given to the bulbs and proper storage facilities are available, this is very satisfactory. It may then be possible not to come back to any particular paddock for 10 years or more, which will ensure that no disease is carried over. Four years should be considered a minimum, if a crop has shown infection of "fire".

The humus content should be as high as possible to counteract erratic rainfall. A grass paddock which has recently been turned in, possibly followed by a well-manured crop of potatoes, would be very suitable.

Little research has been carried out in New Zealand on applications of fertilisers to bulb crops; general practice is to use little or none at all. The lime content of the soil should be good and in most cases a dressing of lime will be beneficial. A neutral soil should be aimed at, and the quantity to apply will depend on the acidity of the soil and past treatment of the land. To ascertain the quantity of fertilisers and lime that should be applied a soil test is necessary. Such tests can be arranged by application to the local horticultural officer of the Department of Agriculture.

Shelter from strong winds is desirable, but an open situation is preferable. If tulips are grown in too sheltered a position, the incidence of pests and diseases will be much higher; "tulip fire", a fungous disease, can be especially troublesome where there is insufficient air movement around the plants during wet and humid weather.

Planting

Tulips for bulb production should be planted before any growth of the shoots becomes evident. The bulbs are never dormant. While tulip bulbs are in storage growth takes place internally, especially flower development, and for satisfactory growth and multiplication of bulbs they should be planted early enough to establish good roots before top growth becomes visible. Furthermore, to encourage root growth it is important that the soil is moist when planting takes place.

The usual planting time is about the middle of March.

The furrows are best opened by moulders. Tractors can be fitted with twin or triple moulders as are used in potato crops, but great care must be exercised to ensure that the furrows are straight and of uniform depth. The importance of uniform planting will be appreciated when the bulbs are lifted, as they are generally ploughed out.

Occasionally bulbs can be seen growing under the Dutch system; they are planted in beds with 5 or 6 rows some 9in. apart. This method requires much more labour and as most of the work must be carried out by hand, the practice is seldom adopted commercially in this country.

The distance between rows varies among growers and to some extent is dictated by the machinery used; distances up to 27in. between rows are usual.

The most suitable depth for planting has been found to be 4in. to the base of the bulbs.

Bulbs are usually planted individually by hand by pressing them lightly into the bottom of the furrow. The distance between bulbs will vary according to the size of the bulbs. Large bulbs may be 4in. to 6in. apart and the smaller ones may be set as close as 1in. apart.

The grades of any variety should always be planted separately, flowering and non-flowering stock apart. That makes management easier, because only bulbs produced from bulbs that have flowered the previous season should be sold; otherwise they cannot be guaranteed true to name and virus free.

[*Jack Welsh and Sons*

Planting in beds as practised in Holland is seen occasionally in New Zealand, but requires more hand cultivation.

Light dressings of fertilisers and lime can be applied before the bulbs are covered. The fertilisers will then be readily available and the lime near the bulbs will assist development of a good outer skin on the new bulbs.

The bulbs are covered by splitting the ridges with the moulder. By moulding the bulbs well up they will not be affected so much by changing atmospheric temperatures and provided the soil is moist at planting time, the moisture will be conserved better. A fairly high ridge will allow better cultivation before the leaves emerge.

Cultivation

Even if cultivation to eradicate weeds has been carried out before planting, the weed seeds that have been brought near the surface during planting will still germinate. These weeds should be killed before they grow too large, and mechanical cultivation can safely be done two or three times before emergence of the shoots.