

Daffodil Production Workshop April 5th 2014

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Introduction

Darragh McCullough of Elmgrove Farm grows 20ha of daffodils for cut flower and bulb markets. This includes over 30 different varieties. Darragh previously studied at Greenmount College and also works as an agricultural journalist.

The farm is situated approximately 1 mile from the coast in Gormanston County Meath. The landscape is relatively flat with clay loam soil and underlying limestone rock.

Prior to growing daffodils the farm produced onions for supply to supermarkets. As a result, cold store & drying facilities are now utilised for the storage of cut flowers.

Markets for Elmgrove Farm cut flowers include supermarkets, local retailers, farm gate sales and occasionally export to the Dutch auction.

Cut Flower Daffodil Production – Field Grown Techniques

Site Selection

- Coastal climates favour early crops, longer growing season and cooler autumn temperatures for daffodil flower development.
- Deep silts and fine sandy loams are ideal soils however daffodils will grow in a variety of soils. Favourable soil characteristics include deep, fertile, free draining and a pH of 6.0 -7.5.
- Cool climates discourage pests and diseases. Avoid warm sites such as south facing slopes that favour the occurrence of basal rot.
- Annual rainfall in the region of 100cm/yr helps to establish roots and encourage bulb growth.
- Avoid sites infected with potato cyst nematode or narcissus fly.
- Avoid excessively windy sites which can result in shorter stems.

Site Preparation

In preparation for planting remove perennial weeds either through cultivation methods or herbicide sprays. Consider sub-soiling 'heavy' soils and plough fields well in advance of planting. After ploughing, power harrow to a depth of 25cm and ideally roll or de-stone. Generally daffodils have low fertiliser requirements and are very sensitive to high Nitrogen levels. If pH is below 6.0, lime should be applied to achieve an ideal pH of 6.5.



Crop Scheduling & Harvest

Cut flower daffodils are normally marketed for Mother's Day and Easter. As dates for these events vary from year to year it is recommended to plant early, mid and late cultivars to ensure availability. Bulbs for planting are ordered in late spring for delivery in early autumn.



Harvesting dates can vary dependent on cultivar, climate and geographical location. Typically it is expected that harvesting will take place over an eight week period from early February to mid April. The influence of weather can make harvest dates more variable from year to year even with the same variety in the same field (Table 1). Flowers are harvested manually up to 4 times per season from each crop. Seasonal labour is normally employed picking 10,000-12,000 stems per day. Expect to harvest 250,000 stems per acre. Dry store bunches of 10 or 20 stems at 0C-1C.

Weather	Plant Reaction
Rainfall in previous year	Flower yield
Soil temperature in current year	Shoot emergence
Air temperature in current year	Flowering date

Table 1. Factors that influence harvest dates & yield

Crop Rotation

At present, commercial growers normally leave bulbs in the ground for 3 years before lifting. A daffodil crop rotation gap of 5 years is recommended. Bulbs that are hot water treated (HWT) normally produce a viable flower crop in the second & subsequent years after planting.

Variety & Bulb Selection

Hundreds of varieties exist and more than a dozen classifications are described. These are usually based on flower shape such as trumpet, large & small cupped, double etc. Important factors for a grower are to select cultivars that produce higher

yields, have good disease resistance and a bulb size/grade that balances cost and yield. It is important to plant early, mid & late varieties if you wish to supply the market over an 8 week period. Commonly grown cultivars in Britain & Ireland include early cultivars 'Tamara' & 'Golden Harvest', mid season cultivars 'Carlton' & 'California' and late season cultivars 'Golden Ducat' & 'Standard Value'.

Early, mid & late seasonal timing of cultivars is also influenced by location and climate eg 'Dutch Master' can be early season in South West England but mid season in east England. Common white cultivars include 'Mount Hood' and 'Ice Follies'. Many of these cultivars became popular for their higher yields, stronger flowers and disease resistance compared to older varieties.

In most cases purchasing better quality planting material results in better quality flowers and higher yields. Bulb suppliers should be able to supply a Plant Passport if within the EU or a Phytosanitary Certificate from outside the EU to certify plant health.

General characteristics of daffodil cut flowers for commercial growers:



- Large yellow flower cultivars – most in demand by consumers
- Stems longer than 30cm in the 'pencil' stage
- High flower yields – 2 flowers per bulb in year 2 (depends on bulb size)
- Continuity of flowering
- Large and attractive buds for cropping in pencil stage
- Vase life of 7-10 days

Integrated Pest Management

Daffodils are normally easy to grow however ensuring healthy planting stock and best practice hygiene routines will help to prevent disease occurrence. Bulbs should be stored prior to planting in a cool and dry environment with good air movement and low humidity. This will help to prevent many pests and diseases such as basal rot, stem nematode and bulb scale mite that favour warm humid conditions. Missed bulbs left in the ground from a lifted crop and weeds should be removed to prevent pests & diseases being 'carried over'. Plant residue in packing facilities, bins or on machinery should be removed as it can harbour nematodes.

The most common method to ensure bulbs are free of pest and diseases is Hot Water Treatment (HWT). This involves dipping bulbs into water heated to 43C - 44C for 2-3 hours. Disinfectants, fungicides and insecticides can also be added to the water. Hot Water Treatment (HWT) is effective against stem nematode, mites, narcissus fly larvae and some fungal infections. However disadvantages of HWT are the possibility of a lower crop vigour and damage to flower buds within the bulb. Some cultivars are more susceptible to damage from HWT such as 'Carlton' and the dwarf cultivar 'Tete-a-Tete'. A monthly fungicide spray programme may be required to prevent fungal diseases.

Pest & Diseases of Daffodil Crops

- Fusarium – basal rot, neck rot,
- Nematodes – bulb & stem
- Large & Small Narcissus fly
- Aphids
- Narcissus Leaf Miner
- Bulb Mites
- Slugs and snails
- Birds & rodents
- Rhizoctonia – Grey bulb rot, soft rot
- Sclerotinia – Black slime, Fire
- Botrytis
- Ramularia – White mould
- Stagonospora – Leaf scorch
- Rust
- Yellow Stripe and White Streak Virus



Market Opportunities and Demand

At present demand for daffodil cut flowers is strong through supermarkets, retailers and farm gate sales. Most supermarkets seek to offer customers locally grown produce whilst export is an important market for many growers especially in England. 60% of the UK's annual harvest of 160 million stems is now exported. It is estimated that the value of UK daffodil cut flowers and bulbs produced for local and export



markets is greater than £45 million per annum. Typically many growers also supply field grown daffodil bulbs for commercial customers (landscape/nursery customers) and to retailers either loose or pre-packed. A recent trend is to supply supermarkets rather than selling through wholesale markets.

Cost Guide

Investment in better quality bulbs and varieties normally results in higher yields and returns. However bulb prices can fluctuate. Prices of planting material vary depending on variety but usually £400 to £600 per tonne wholesale. Bulbs are sold in sacks of 25kg with 40 sacks per tonne/pallet. There are approximately 18,000+ bulbs per tonne or 375 per 25kgs – depending on bulb size and grading. Delivery cost from England is in the region of £70 - £90 per pallet. 25kgs sacks are priced at £12-£18 wholesale excl. delivery.

It is estimated that on a medium sized production scale of several hectares production costs including labour and machinery is in the region of £700/£900 per ha. Other associated costs (excl. labour) includes hot water treatment of bulbs to control pests & diseases (£45-£95 per tonne), fertilisers for first year if required (£140-£170 per tonne), herbicides/fungicides (£890 per ha), bulb drying & storage (£12 per tonne), grading (£1,200per ha) and transport & packing (£720 per ha). Labour for harvesting is estimated at £340/ha. Estimates of gross margin for field grown daffodils cut flowers are £2,500/ha over a 2 year cycle and £2,400/ha on average for bulbs.

References

Hanks, Gordon (2013) *Narcissus Manual*, Horticultural Development Company, England.