

Chapter 12

Husbandry

A contemplation of the bulb industry ought to include a section on husbandry but the detailed recommendations have been well presented in Ministry bulletins and cannot be improved on whether for bulb growing or for growing flowers under glass. The technology is forever changing as new procedures and treatments evolve. These details again are set out in advisory leaflets. So I propose to inflict on the reader a few moments of musings into which he may dip or scan as he pleases according to his taste.

For the gardener the tulip or daffodil is the most rewarding and least difficult of friends. Provided that the bulb is obtained large enough and healthy, even though sprouted or rooted, planted in any garden soil with adequate water, it will produce a bloom and prove one's success as a potential Percy Thrower. It can endure poor soil, clay or weed competition; everything except drowning in water. The daffodil even enjoys a site beneath trees. The flower and nourishment is in the bulb before planting as can be shown in the house by growing in inert sand, peat or a glass of water.

Growing bulbs on a commercial scale takes a great deal of care and attention to detail at all stages and unless a grower is prepared to give that close attention at all times he had better stick to wheat or other less demanding crops. The best growers develop an empathy with their stocks in the same way that a good dairyman knows every one of his cows. When Royce Scrimshaw describes the treatments he is using, you can feel him shiver as he dunks warm bulbs from a heat store into a bath of cold dip.

The starting point is the soil. Bulbs respond to the type and condition of the land in which they grow and the soil affects both growth of the crop and appearance in shape and skin finish for marketing. In England alluvial silt soils are most satisfactory and have good water retention in the growing period and if they do not contain too much clay fraction,

allow easy harvesting with less damage from clods. All fields for bulbs should be well drained and a high pH is necessary for tulips, though daffodils will tolerate a higher degree of acidity.

Both tulips and daffodils will grow on a wide range of soils, mineral as in Cornwall, loam, peat and sand. English sands should not be confused with the pure sands of the Netherlands where water table management is a crucial factor. Clay soils tend to produce bulbs with poorer shape for the retail trade and a duller skin apart from the physical difficulties of damage and clod separation at harvest. Peat land gives a duller skin finish and often needs irrigation in late spring and with most English sandland irrigation is essential. A further risk on both peat and sand is that these soils can get very hot in summer and encourage spread of fusarium, base rot of narcissus and sour in tulips.

The soil can be improved by the addition of humus; well rotted farm-yard manure is best applied to preceding crops and soils low in humus can be improved in structure by ploughing in well rooted grass leys.

All bulb growers give their crops a good start in life with an adequate dressing of base fertiliser. The experimental work at Kirton on Class I land has shown no significant response from fertilisers but Napoleon knew that his army's marching power depended on its stomach and with the same philosophy no husbandman feels comfortable unless he starts off a valuable stock of bulbs without being certain of an adequate supply of plant food in the seed bed. Generally a balanced compound fertiliser for potatoes (12N-12P-18K) at 8 to 10 cwts. per acre is used but painstaking growers have developed their own sovereign remedies and one can only judge by the results. Slow release organic fertilisers incorporating fish and meat meal and dried blood have their adherents and Len Braybrooks has been heard to swear by the efficacy of bone meal. Other growers use a top dressing of sulphate of potash which would probably be better in the base dressing, while others extend the growing period with top dressings of nitrogen.

Recently liquid fertilisers have been injected into the rows of second year daffodils and foliar feeds with trace elements are available for application throughout the growing season. Growers claim benefits from these treatments although experimental evidence is still inconclusive. My own theory, also unproven, is that the grower who cossets his plants in this way also takes the greatest care in all other phases of husbandry. As an example the most important start in life for a bulb crop is a good root run in the planting stage. Such a grower would, in a very wet autumn, change the area planned for bulbs if it became too sticky to cultivate and prepare new ground elsewhere.

The planning of bulb ground well ahead is best done to allow a rotation giving a rest from bulbs for eight years if possible, to allow destruction of ground keepers and prevent build up of disease. Good bulb land is valuable and growers are risking much closer rotations, some growing daffodils, tulips and gladioli and onions within the same rotation. Quite apart from carrying over fungal and bacterial diseases, the races of eelworm which attack bulb crops are fairly specific but in the absence of precise knowledge there is always the possibility that similar crops, like onions, will act as host plants to keep any eelworm population ticking over in the same way that other crop and weed plants can act as hosts.

The rotation is a health safeguard and so is local knowledge. Fields have been reshaped, pits and ditches filled in, and some surprising outbreaks of eelworm have been traced back to the use of carted soil and bulb waste to fill holes and ditches twenty years earlier.

Planting today is universally done in ridges like potato ridges by a mechanical planter, sowing the bulbs in a band eight to ten inches wide in ridges from thirty to thirty six inches apart, two ridges at a pass. This enables mechanised handling from the store to field and permits the use of one or two row mechanical harvesters adapted from potato designs for lifting the crop later. Optimum planting rates today are 5 to 7 tons per acre ($12\frac{1}{2}$ to $17\frac{1}{2}$ tonnes per hectare) for daffodils and 3 tons per acre ($7\frac{1}{2}$ tonnes per hectare) for tulips. These rates will vary according to the sizes being planted and with valuable stocks most growers give wider spacings. Too close spacings can affect the shape of the finished bulb and small size tulip bulbs need more air and light to prevent early death. Iris and gladioli grown for flowers need adequate spacing and gladioli corms planted too thickly will fail to produce a flower spike.

Until the introduction of mechanical planters which forced the switch to ridges, all bulbs were planted by hand in beds of five or six rows. Large gangs of women planted the bulbs individually along the marker on the side of a plough furrow, missing the sixth or seventh row for a path way for later work. This gave an ideal spacing pattern for light interception above ground and ample room below ground for bulb development and easier removal of rogues or diseased plants.

The plough most popular was the light wooden framed Cook's plough and the horseman was the key man in the operation. The skill of these men was remarkable. They ploughed a straight and even furrow all day, could guide the horse by word of mouth and rarely allow the huge feet of the animal to trample on the bulbs. Perhaps even more remarkable was their ability to plough out that same furrow at harvest next year with little to guide them in a green sea of weeds. A good ploughman could



S.H.E. Competition Classes 1983.

Photo: Springfields

The writer, forcing bud daffodils in mobile glasshouses, 1983.



make his plough turn a seam which split and displayed the bulbs on the top of the soil without a lot of scratching or raking. Tulip bulbs tend to "find their own depth" after planting so that the depth of each row was slightly uneven. The test of the right depth for easy picking was that the plough could cut an odd bulb every yard or two. This test was all well and good until it came to a variety which produced "droppers" in dry seasons and it has been known for the plough to leave a whole row of bulbs below the furrow bottom. Droppers are new bulbs formed below the planted one, sometimes found in a dry season.

Bulbs are planted down for one year except for daffodils which are usually left down for two seasons. Daffodils are lifted after one year in the Netherlands and some growers are testing annual lifting in the U.K. They are either seeking improved yields or a size and shape of bulb for a particular market. Other growers lift certain stocks after one year to split that stock for biennial harvesting so that they have some to use each year instead of every other year or to give an annual treatment to clean up an attack of fusarium.

Spring brings rapid growth of the foliage, flowers and weeds. For fifty years weeds had to be removed by hand and vast gangs were needed to pull or hoe the weeds and aerate the soil surface with small hand cultivators. By midsummer the dying bulb foliage gave no competition to the weeds and they grew rampant. Bulbs were notorious as a dirty crop, lost in weeds by harvest to the contempt of the farmer neighbours.

By the 1950's herbicides such as C.I.P.C. were introduced which controlled many weeds for a period of twelve weeks until foliage senescence began. Little damage to the bulbs occurred unless heavy rains washed the chemical down through sandy soils. Over succeeding years a range of contact and residual herbicides have been tested which give weed control throughout the one and two years growth cycles. Even perennial weeds such as couch, thistles and willow weed are being treated with glyphosate during late summer dormancy. So successful have some growers been with weed control that a few are now experimenting by leaving some deliberate weed cover to prevent high temperatures building up in the soil in late summer.

Spray treatments used on the growing crops vary with the crop. Tulips must be given a protective coating of fungicide against "fire" (*botrytis tulipae*) during the first few inches of growth, repeated as new growth appears and after flower picking, heading or hail damage. A cold dip in systemic fungicide (benomyl) before planting delays the need to move in very early with the first spraying, though repeated use of this or any material could lead to immunity eventually. Gladioli should be sprayed in full growth with a cocktail incorporating fungicides to ensure clean

healthy foliage and insecticides to control thrips and aphids, including the unsightly black fly and in some years, caterpillars.

Field spraying of daffodils has not been judged necessary in the eastern counties though fungicide treatment is essential in Cornwall especially in humid spells in well shaded fields where staganospera can wipe out foliage completely in a few still, warm days. Recently, eastern growers have tried fungicide sprays on daffodils using maneb, benomyl or a combination of both to prolong growth by keeping foliage clean, to reduce development of smoulder and to protect foliage damaged by frost or by flower picking. It is also hoped that well timed spraying will help to prevent the development of neck rot in the bulb after harvest.

The crops are walked during the growing period to remove rogues. These are bulbs not true to type or plants showing signs of disease.

Tulips should be walked immediately after emergence to remove "primaries" — stunted plants showing signs of fire spores which would spread and inoculate the remainder of the crop.

Odd bulbs of a wrong variety or plants showing symptoms of virus should be removed at flowering time because the colour break virus is easily seen at this stage.

Roguing of daffodils is done in the same way but since the two main virus symptoms appear at different growth periods, the yellow stripe virus is best removed early (March and April) and the white streak virus later. There are twelve known types of virus affecting daffodils with perhaps more still to be identified which is reason enough for the research into producing virus free stocks. Some of our popular varieties are fifty years old and all are vegetatively propagated which means that any virus in the stock is also propagated. In simple terms a stock cannot be improved as a livestock herd can, a grower can only stop his stock getting worse.

Logically new stocks grown free of any virus should give dramatic increases in quality and yield as happened with the new healthy stocks of Sol d'Or. The debilitating effect of viruses in other commercial daffodil varieties may not be so great. Some of the lesser viruses seem to cause little interference with growth and show few or no symptoms. It is, however, to be expected that combinations of several viruses may be the explanation of gradual debility in certain varieties or stocks of those varieties which grandfather tells us used to be much better when he were a lad!

In case the subject of virology is beginning to alarm any prospective daffodil grower or gardener, I hasten to add that the viruses which are known to be damaging to quality and yield do have recognisable symptoms and can be removed by roguing. Re-infection is much slower

in daffodils than tulips and if a stock of daffodils can be kept at a virus count of 2% or below by regular roguing which is not difficult, then that is found to be commercially acceptable both for flowers and bulbs.

The roguing teams of my youth could be seen slowly passing through the fields bearing large black umbrellas on sunny days to the mystification of passers-by. This was to give a better sight as the foliage passed into the shadow of the tiny spickels on the leaf caused by the first visible symptoms of eelworm damage. Today roguers find more efficient control of eelworm by hot water treatments before planting and usually carry a narrow roguing fork and plastic fertiliser bag to carry off unwanted plants for disposal.

I mentioned earlier the difference in pecking order, if not social standing, between the early bulb growers and their contemporary flower growers. This could occur again for two reasons. A much tighter economic squeeze on bulb growers has led to more of the traditional bulb specialists both in the U.K. and in Holland taking a harvest of flowers when the demand warranted it to cover their labour charges during the growing period. When flowers were pulled in bloom it was possible to see and leave behind off-types for roguing. The demand for tight buds and pencil straight buds means that the flower pickers cannot see the eventual flower and roguing for purity of variety is near impossible. This change points to the need for a new elite type of grower who will specialise in production of good clean stocks.

Debates on the merits of de-blossoming and the harm of flower picking will continue as long as bulbs are grown. Every grower is an expert on the subject and I ought to hesitate to rush in.

However, the subject embraces three elements, first the reduction of plant tissue, second the stimulation of vegetative growth and lastly the effect of damage to the plant.

The first is fairly obvious because in removing a flower along with stem and foliage, which is the greater part of the plant, reduces any power of regeneration of fresh leaves to feed the bulb or corm beneath. Thus gladioli and iris cut for flowers, yield only a half or less of the potential bulb crop. Often the whole plant is pulled bodily and the bulb discarded as not worth cleaning and replanting. Tulip flowers are cropped leaving the large bottom leaf or occasionally two leaves to feed the bulb to maturity. This drastic treatment reduces the size of bulbs by between one and two centimetres in circumference. Taking the flowers from daffodil plants removes much less of the plant, merely stem and bud but no foliage. There is much less loss of photosynthesis to the daffodil plant yet reductions in yield can be as high as three tons per acre of bulbs — due mainly to damage.

The removal of flower heads and florets does less damage to the plant, it leaves a green stem which has a capacity of carrying on photosynthesis and the removal of seed production diverts the energy of the plant into vegetative reproduction in the bulb. The removal of flowers from the plant prevents petals and pollen falling on the foliage and rotting to set up foci of botrytis. Hyacinths are always de-belled, tulips headed and in Oregon and Washington State, U.S.A., daffodils are deblossomed to prevent botrytis. In eastern England daffodils are rarely deblossomed though some growers do take the flowers off to prevent the formation of the large seed pods.

Far more damage is done to the plants during flower picking than most people are aware. The effect on daffodils is to give an entry point in wounds for fungus diseases and bring about early senescence losing a week or two of growth at the best growing period of the year. The shortened stem with an open wound is a potential entry point for diseases of the neck to develop later. In picking tulip flowers the damage is even greater because the plant is much more brittle and foliage is damaged in merely moving between the plants.

It is debatable whether virus diseases are spread by sap on the gloves and knives of the flower pickers and the knives of the tulip heading machines but the spread of infection seems most rapid in those varieties of tulip grown mainly for flower cutting later in the season. The other factor which may be different for those late varieties is that they are more likely to be still in full growth when colonies of virus transmitting aphids begin to migrate in early summer.

Picking of daffodil flowers is usually limited in the eastern counties to second year stocks which produce a sturdier stem. In Cornwall and Devon the flower crop is all important and first year flowers are also taken after a careful pre-treatment to avoid flower damage during hot water treatment. A recent technique developed in Cornwall produces very early flowers in the first year by giving the bulbs a period of artificial winter in cool storage before planting. This treatment produces outdoor flowers before Christmas at a fraction of the cost of greenhouse forcing though it does reduce the final bulb yield.

The demand of flower traders for bulb flowers in tight bud has become universal, yet there are still a few disquieting features. Overall the customer has gained better value — lower cost and better vase life. For most commercial varieties of cut flowers the new practice is an improvement. Buds travel better with less bruising and even straight “pencils” will open satisfactorily given warmth and water, with only a slight loss in flower size. Some varieties however are reluctant to open if cut too young and many of the newer double or ruffled cup specialities would be much

more attractive if offered half open. Tulips too give the most satisfactory results when cut at the half coloured stage. Flower traders today rarely have detailed knowledge of varieties and simply demand (and pay for) large green buds. Too often the trade looks for the large size of the Darwin hybrids and bypasses the more rewarding, but delicate, Mendels. Biggest is not always the most beautiful. Fortunately there are still a few florists and salesmen who do take interest and there is still a limited market for the choicest flowers. I attended a cousin's wedding in London where the whole church was decorated throughout with lovely pink *primulinus gladioli* — variety Good Luck, when we had ceased growing it in quantity because most salesmen judge quality by the length.

I still feel happiest cutting flowers a stage nearer maturity for the house — goosenecked daffodils or spiked flowers with one floret opening. Perhaps we shall soon see a move back towards this when all flower stockists have a cool room where all their bloom can be properly re-charged with water and held at the correct temperature before sale.

Flowers in the home should be fully charged with water before arrangement by plunging in water in a cool place overnight or longer. A quarter inch should be cut from the bottom of the stem to enable drinking; this plunging is essential for tulips, though some varieties, Orange Triumph, High Society, etc., remain erect after travelling dry. Vase life can be lengthened by arrangement in a cool hall or putting in cool places overnight; draughts, hot spots, radiant heaters, radiators, even sunny windows can expose flowers to uncomfortable temperatures. Gas fires are particularly damaging.

Many arrangers have their own remedies for improving the life of their flowers. If you have good results from adding silver nitrate, sugar solution, aspirin, bleach, salt or even an old penny, do carry on. Most florists offer chemical preparations such as Chrysal or Phostrogen which help, but the best rule is to give frequent changes of fresh water preferably with the addition of a mild bactericide to prevent clogging of the cells which carry water. The flowers are for enjoyment and if the central heating has to run at seventy degrees, no matter: flowers are still one of the cheapest and most satisfying pleasures in life.

When the foliage has 90% died down in the field the bulbs are ready for lifting. Bulbs required for early forcing have to be lifted green to allow time for the periods of temperature treatment needed. Tulips are easiest lifted early while the clusters still keep together and the ideal stage is when the white tunic begins to become biscuit coloured. Almost white skins will colour during storage and late lifting in days of wind and sun will invariably crack a fully mature tunic which is liable to break away during cleaning and handling. Dead foliage used to provide a guide for



Girls tying daffodils in staged bunches, Seymour Cobleby 1960

Photo: Miss Herring

the old ploughman but clogs the mechanical lifters used nowadays. Ridges are cleared by flail choppers or by lightly rotavating and harvesting proceeds with equipment ingeniously adapted from potato harvesters.

Daffodils may be lifted direct from the row into bulk carts or half ton bins to be processed in bulk through drying stores equipped with heaters and forced air ventilation. Some twin row harvesters lift the same two rows as planted by the row planter which lessens the scope for error.

Where the soil is very cloddy or stony or where a lot of small quantities of many varieties need separation, growers lift by elevator digger and pick by hand into drying trays which are then palletised for easier handling. After lifting, all bulbs, except lilies, should be dried as soon as possible. Growers giving a chemical dip for fusarium or washing bulbs to obtain a soil free sample for export must have an adequate drying capacity.

The order of lifting varieties usually determines itself by the order of dieback of foliage. This natural order is over-ruled by the need to prepare early forcing stocks and by the old saying "Poets last up, first down". Certain varieties, especially poeticus and poetaz, have no dormancy period and should be lifted as late as possible and replanted as soon as sterilised.

Tulips have not been mechanised to the same extent as daffodils. The bulb is much more susceptible to damage from bruising and, for resale, the skin is liable to split away unless care is exercised at all stages. I have seen tulips handled in bulk loads of up to twelve tons, hydraulically moved through cleaning and sizing equipment into store with more or less success. The tulip however, does not forgive any mistakes in handling, (Horton in 1932 was saying "handle like eggs") and most growers in England lift tulips by slow running elevator diggers and pick by hand into trays or bins.

After lifting, bulbs are dried and go into storage before planting. For the commercial grower this is the most important period and to use the expression of an old Dutch grower — the success of the tulip crop is made or lost in the storage shed.

Gardeners should not be worried. All bulbs can be successfully stored until planting time in a dry, airy shed with the simple proviso that gladioli, dahlias and begonias must be kept free from frost. It is best not to attempt to "treat" bulbs unless the temperatures and ventilation can be closely controlled. Too high humidity will spread fusarium (sour in tulips can be smelled in a store) and while fusarium does not develop once a certain temperature band is reached, too high a temperature for a

few hours can spread rhizopus through an entire chamber, to bring total loss.

The treatments used in storage today can manipulate the growth and flowering time in many ways and while there is a varietal difference in response, the procedures are well tested and set out in the A.D.A.S. bulletins. The timing and stage of development of the flower is quite critical and any variation from the recommendations can bring the opposite results. To check the stage of development of the embryo within the bulb before and after each treatment, a number of bulbs must be cut open and examined.

The flowering date of daffodils and tulips can be advanced by giving an artificial winter for six to eight weeks in a cold store at 48°F (9°C) to certain varieties. Even earlier flowering can be obtained by accelerating internal bud development by giving five days of high temperature immediately after lifting. These are standard treatments for early forcing and for early flower production in Cornwall.

Flowering similarly can be delayed by storing at high temperature which enables tulips to be delayed in emergence to avoid frost damage in spring, to split a large stock of one variety for flower cutting into two parts, one to flower normally, the other to follow ten days later, or to retard the flowering of a late variety in order to have flowers when market supplies run short.

Another treatment often used especially on the Copland varieties was blindstoeken or heat blasting of the bud to prevent flower growth on stocks of bulbs required to grow on for forcing.

The reproductive habits of tulip varieties vary in that some produce too many offsets and others not enough. Planting stocks of varieties which split easily should be stored in a separate chamber and the temperature controlled between 73° — 77°F (23° — 25°C) until flower formation and then reduced below 68°F (20°C). Planters for which it is intended to increase the offsetting should be held at higher temperatures after flower formation at 77°F (25°C).

Gladioli form flowers in the foliage and are not responsive to temperature treatments. Normal storage requires low humidity to prevent premature rooting and absence of frost (best at 50°F or 10°C) but growth can be advanced by warming slightly before planting to commence sprouting.

The flowering of iris is manipulated on a large scale in order to have flowers available over a very long period of the year. Very early flowers can be obtained by early lifting, three weeks in heat followed by six weeks cooling at 48°F (9°C). A flower crop to follow this will be obtained by lifting at normal dates and then give heat and cool

preparation. Smoke treatment is now a standard preparation for forced iris bulbs. The physiology is unknown but the gases (probably ethylene) allows smaller bulbs to be used successfully.

Late flowering can be induced by holding in warm storage at 63°F (17°C) and planting out later but very late flowers can be produced by retarding the bulbs in warm storage for planting in the following summer. Retarding is not suitable for yellow varieties.

It has long been the custom to offer for retail sale hyacinths which have been prepared to flower in time for Christmas in the same way as tulips. The treatments require a set period of weeks and there is a probability of poor results if the times are shortened. Retailers and customers should be patient and not press for delivery too early, particularly in a late season when wet weather or late maturity has delayed the start of the treatment.

Bulbs for early flowering in boxes or pots for the house should be planted as soon as possible after completion of temperature treatments and plunged in a cool place after watering. On a commercial scale this is done on a standing ground, kept cool under watered straw, while rooting takes place. Sandy soil is the traditional planting medium, but for easy handling growers have turned to peat.

Since the growth of foliage under straw can become entangled for batches forced later in the season, many growers "double cool" the later rounds by putting the planted boxes back in cold store until required in the glasshouses.

Tulips to be forced by the 5 degree method are held in cold store in dry bulb condition to be planted direct in border soil when required. Since these bulbs have to make roots very quickly when planted it is best to ensure that there are no hard tunics which, in the commonly used Apeldoorn, may contain the mass of roots inside the jacket. Very hard skins are peeled off to give free root run.

Some of the popular varieties are fifty years old and still going strong, Golden Harvest, Carlton, Fortune, Actaea, Cheerfulness. They have survived because of many good qualities, not the least of which is stamina. I doubt whether any breeder or selection panel would give Carlton a second chance if it appeared in seedlings today, yet it has outlasted many rivals and accounts for forty per cent of all planting.

The natural vigour in a stock of bulbs should be maintained by careful management of stocks. A proportion of the largest bulbs (mother bulbs) should be retained and planted back again. In some cases a grower may even decide to select out mother bulbs and grow them on separately and later discard the remaining stock. Selling off the large and planting back the small bulbs in a stock year after year, is selection of the weakest and



*Prepacking Bulbs for Retailers
A Busy Bulb Warehouse at Weston*

Photo: Lingarden Ltd.

Photo: Lingarden Ltd.



increases the proportion of naturally weak growing bulbs. This of course applies to round bulbs and not the "splits" or offsets which should grow with the same vigour as the parent.

The equipment used on bulb nurseries today is very sophisticated and the expense may deter a new grower. It is possible to start in a small way with the barest essentials and hire the larger services such as cold storage and sterilisers. I can recall that in 1950 I had only a plough, some baskets, a wooden bench and a set of round wooden sizing riddles for checking the grades we wished to sell.

On a bulb nursery today one would expect to find and use drying equipment, heat chambers and cold stores for conditioning and a range of soil extractors, rotary barrel or reciprocating screen (sand jig) with the necessary elevators and bulk hoppers, various brush or rubber pintle cleaners and sizing graders capable of putting out up to six sizes with daffodils being graded on a long slot plate and other bulbs over round hole screens. An efficient sterilising plant for hot water treatment is essential and most growers need a cold dipping plant if they have not ventured into washing as well. Most of this equipment merely performs mechanically what had to be done by hand in bygone days. The tool which has most changed the bulb grower's life has been the fork lift truck. Every bulb used to be man-handled in hot humid or dusty conditions about fourteen times before being sold or planted down again. The palletised load allows us to handle tons quickly at the touch of a lever with only a fraction of the toil and sweat.

Gardeners who call at bulb nurseries for supplies are sometimes confused by the sizes. Catalogues often give a vague definition of "top size" or "flowering size". Growers and merchants describe a bulb grade by the measurement of the circumference — a twelve centimetre tulip is twelve centimetres round its widest point. Even daffodils are generally sold graded to centimetre sizing, which is more precise than the somewhat subjective D.N. (double nose) I's and D.N. II's.

The confusion is justifiable when the grower tries to explain to the disbelieving customer that English grown bulbs have denser tissue than the Dutch and that flowering size tulips are satisfactory at one centimetre size lower than Dutch, that most short cup narcissi are naturally smaller than trumpets and flower well in smaller grades and, to cap it all, that the species bulbs rarely grow to more than very small sizes anyway.

Life on a bulb farm must appear delightful in the glossy magazines. Our overseas visitors take home beautiful colour pictures of flower picking in the sunshine. Truth is, work on a bulb farm embraces weeks in choking dust, sweating in steamy glasshouses and days in the open chilled to the marrow in biting east winds. It is always said in the trade

that the only flowers worth any money are the ones picked in overcoats. Comfortable picking weather in the field brings gluts and low prices. The Cornishmen have come to terms with it; sunny days they seem to go out in the boats and when it is foggy or raining, stay home picking flowers.

The life also brings physical tribulations. Bulb rash is a malady best described as a form of dermatitis verging on allergy. Hands, skin, eyes or sinus can react painfully to contact with dust or the skin of bulbs, tulips being bad but hyacinths worse, or other people are affected by the sap when cutting or breaking stems and by the pollen from open flowers.

Every person reacts differently and in severe cases medical advice is to keep away from bulbs or flowers. In extreme cases reaction can be completely debilitating if not fatal.

In 1920 the bulb growers association was recorded as seeking a cure and recommending a salve prepared by the Spalding chemist. The scourge is still with us, though careful washing with disinfectants, use of barrier creams and rubber gloves help to alleviate the misery.

The bulletins on pests and diseases are quite detailed but two practical points may not stand out in an official document. The first concerns the narcissus fly, a recognised pest of the south west but virtually unknown in the eastern counties. Either we are undergoing a climatic change or it has spread from imported stocks, but of recent years the narcissus fly has begun to appear more regularly in the east. The most effective treatment is aldrin, one of the organo-chlorine compounds so much in disfavour. Like all sections of the horticultural industry, bulb growers urgently need effective replacements for materials which go out of production.

The other pest is the funniest of all; it is the pheasant. Proud and bold it struts, joy to the sportsman's eye. But it does enjoy eating the juicy tulip bulb in spring and will industriously destroy yards and yards of rows. It is a lordly and discriminating bird and favours only the most expensive varieties. My first stock of Aureola was decimated by the brutes one weekend and I had to wait until October to get my revenge and eat one of the most expensive dinners ever cooked.