

Chapter 9

The Scientists. Research and Development

Bulbs and corms have been the subject of much study by botanists and over the centuries species of tulips have been collected from a large area of Asia and Asia Minor, from a broad belt along the same latitudes from Turkey to Western China. Many of these species tulips are delightful specimens and some are available today in their original form from specialist nurseries. Listed today are *Tulipa Clusiana*, *Fosteriana*, *Acuminata*, *Linifolia*, *Kaufmannia*, *Tarda*, *Greigii* and *Eichleri* and many others.

Recently the species have been crossed with cultivated varieties to produce the charming group of *Greigii* tulip with compact habit for bedding or rockery use, delightfully shaped flowers with petals shaded inside and out carried above ornamentally striped foliage like *Red Riding Hood*.

Other crosses give different selections of even more compact plants — *Kaufmannia* hybrids and *Fosteriana* hybrids.

Another very popular variety in its own right is the multiheaded *Fosteriana praestans Fusilier*.

Bulb flowers have had an important place in the British garden since before the seventeenth century and though Britain avoided the excesses of the Tulipomania which swept the Netherlands like our South Sea Bubble, tulips and daffodils have held the interest of gardeners and gardening clubs and societies through the years. By the beginning of the present century the profusion of names and varieties was made more confused by the introduction of large numbers of Darwin and Cottage Tulips often given names without care to check names already in use. There were many types of tulip available without a satisfactory system of classification.

In order to remedy this state of affairs the Royal Horticultural Society, which had a Narcissus and Tulip Committee, appointed in 1913 a Tulip Nomenclature committee consisting of leading British and Dutch

specialists to draw up a scheme of classification and settle questions of synonymy. Despite the difficulties of the war period trials were conducted at Wisley and later in Holland. The first report produced in 1917 formed the basis for classification of tulip into groups and started the list of approved names which continues to this day with new varieties being submitted for trials and accepted into the published list which is periodically revised to cover over 7,000 named varieties.

Development of new groups led to a revision of the classes after 1930 when Mendel and Triumph tulips had been introduced. This basic classification continues to the present day with the addition of sub-groups as necessary.

The same difficulties of description for daffodils had long plagued gardeners; even in 1629 botanist John Parkinson attempted to bring 'methodical order' to 'the great confusion' and 'manifold varieties of Daffodils'.

So a similar classification scheme was prepared for narcissi by the Royal Horticultural Society in full consultation with Dutch specialists and a precise specification was prepared for each class with nine main divisions with two further divisions to accommodate species and miscellaneous narcissi not already covered. This classification system held rigid for decades and formed the official guide for the published approved lists of varieties, descriptive catalogues and for preparing the sections of show classes.

However the ingenuity of daffodil breeders continued to contrive ever new shades of colour and shapes of corona and corolla until the official classification could no longer adequately deal with the profusion of ruffled cups, doubles and split trumpets coming from the new seedlings. The borderline between trumpet and short cup and small cup had become so confusing that a move has been made towards a simplification of divisions with an agreed colour coding to add more precision for closer definition.

After due consultation and a good deal of dissent a new official classification for narcissi with the use of letters denoting colour shades to replace sub-divisions was finally introduced in 1974.

The Royal Horticultural Society maintains its interest in bulbs, holding its Spring Daffodil Show at Vincent Square in London and through a specialist Narcissus and Tulip committee, currently chaired by H.A. Kingdom, operates variety trials for new introductions, updates approved lists of varieties and published a Daffodil and Tulip Year Book until 1971 when it became a simpler publication entitled: Daffodils' as an annual of more general interest.

The official work of the R.H.S. is supported all over the country by gardeners' societies and shows, some of which, at Wakefield for example, still nurture the tulip with striking breaks of colour so popular over the years.

At Spilsby the Lincolnshire Daffodil Society holds an annual daffodil show in the Town Hall on the third Saturday in April each year. A fine array of spectacular bloom is staged in a county of commercial growers, by many enthusiastic amateurs who proudly display superb specimens specially bred for exhibition classes.

Founded in 1902 the society has a strong membership and owes much to the enthusiasm of chairman G.H. (Harry) Caudwell.

The growth of a new and burgeoning industry had not passed unnoticed by the Ministry of Agriculture. Soon the horticultural experts were called on to advise on problems of pests and diseases and techniques of husbandry.

Local offices gradually built up a store of experience and over fifty years steady development a good support service with scientific backing has been developed.

In the early years it must have been difficult for the officers concerned because the early growers were a secretive lot. If they had a new variety, a new method of multiplying their bulb stock or a trick for producing earlier and better flowers that was their trade secret and worth hard cash to competitors. It has always been an expensive business to learn. Newcomers have to buy the right stock, equipment and gain the expertise to succeed in a competitive market.

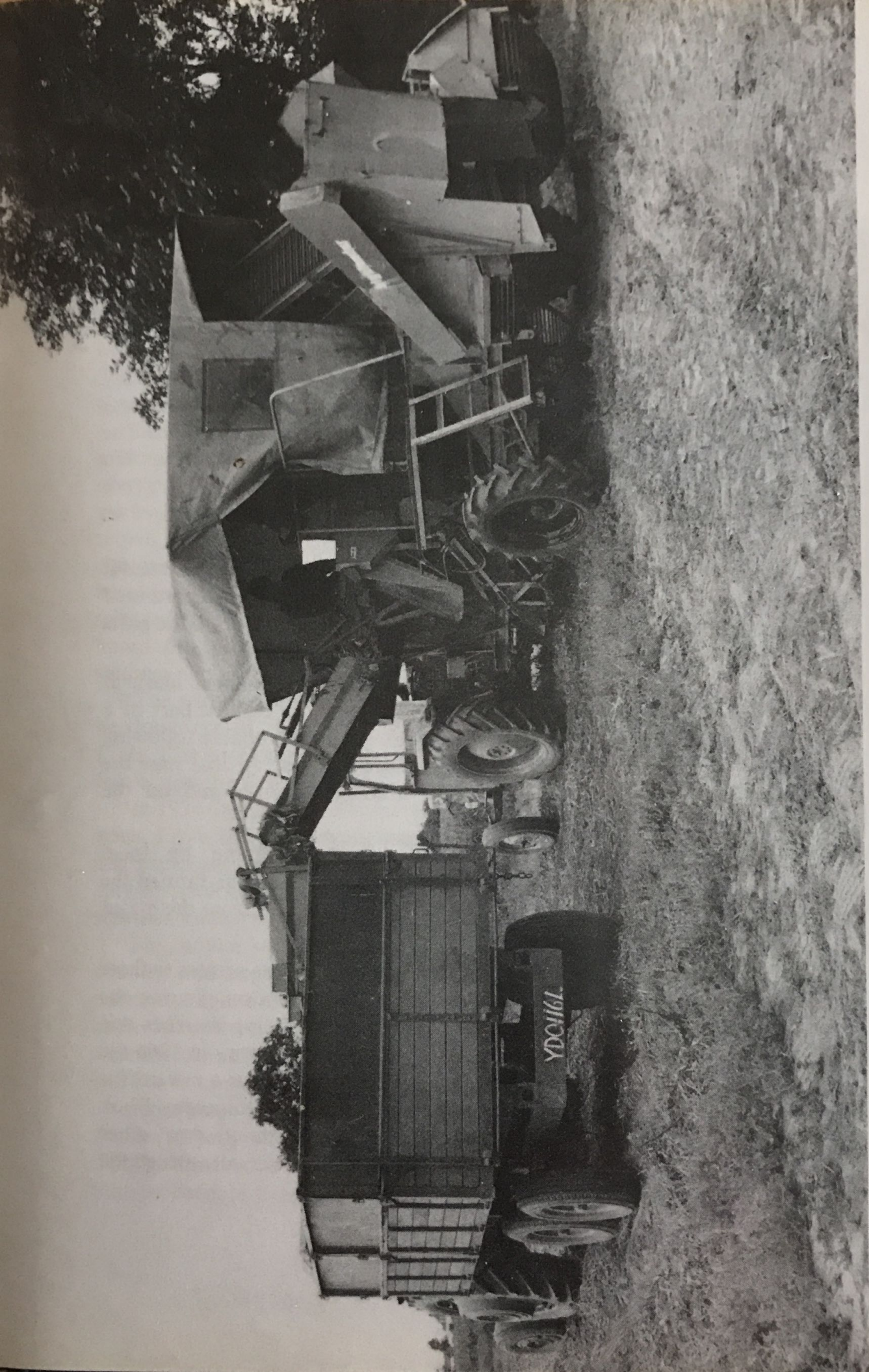
As one grower summed it up, 'It's going to cost me a couple of thousand pounds in mistakes to start, but I'll have a go.'

The soundest method in those early days was to serve an apprenticeship with a recognised grower before investing in a new venture.

Responsibility for agricultural and horticultural education at the beginning of this century lay with the County Councils. The Holland (Lincs.) County Council used the Kirton Institute as its farm centre and the early work on bulbs began there.

In 1931 the Agricultural Education Committee of the county council published its first report on Experiments with Bulbs. It reported on experiments started in 1931 on the husbandry of daffodils (King Alfred and Ornatus) and of tulips (William Copland Bartigon and Farncombe Sanders) and hyacinths. Already hot water treatment was advised for sterilisation of daffodils against eelworm.

By 1932 the next report dealt with dates of planting, manuring, flower removal, depth of planting and spacing — the same subjects of invest-



Mechanised Harvesting of Daffodils at John Ellis, 1980

igation today! It was published this time by the Bulb Research Subcommittee. A new body this, chaired by A.W. (Alf) White, supported by inter alia Cecil Robinson, Alex West, G.F. Bateman, F.H. Bowser and D.V. Konynenburg. The reports were submitted by J.C. Wallace, Principal and D.E. (Don) Horton, Assistant for Bulb Research. This was the first of Don's reports and the beginning of a career specialising in bulbs which continued with distinction for another thirty five years.

These first two reports were something of a landmark for the beginning of official commercial bulb experiments and my first sight of them duly ensconced was in the library of the Royal Horticultural Society in Vincent Square.

The evolution of Kirton as an experimental station is steeped in history stemming from the growth of the towns and villages round the Wash where settlements had to develop on the areas of higher ground. The following brief story of Kirton E.H.S. was prepared by Director Ian Sandwell for the retirement of advisory committee chairman W.E. (Ted) Grant in 1982 after sixteen years in office marked by the award of an O.B.E.

“Crops have been grown on the site of Kirton Experimental Horticultural Station since pre — Roman times. The earliest record is of land occupied in the area by the Belgae who were invaders from the parts of the continent which we know as Belgium and Holland.

“The Romans were the first settlers to have a permanent mark at Kirton. Willington Road, which divided the Station, formed part of a Roman way which uncharacteristically was winding, probably following animal pathways across the partially drained marshes. At that time the Romans were carrying out extensive drainage schemes and on the reclaimed land their roads were straight.

“Evidence of Roman occupation has been found by local archeologists in Vicarage field on the Station. The Romans farmed the rich soils of the area exporting large quantities of grain from the major port of Wainfleet.

“Saxons followed Romans and many local names bear witness to these European invaders — for example Kirika Tun or Kirton. During the seventh and eighth century the Saxons continued building churches and draining and cultivating the land. After William 1's victory in 1066 the Soak (Soke) of Kirton was given to the Earl of Brittany as a reward for his part in the fighting. Kirton was recorded in the Domesday Book which mentions, in addition to the Earl of Brittany, two other landowners in the area so it is not possible to say who actually owned the site of the Experimental Station at that time.

“Between 1200 and 1210 land in the Kirton area was given to Swineshead Abbey which with land occupied by the Experimental Station was held by one owner, Sir John Locton. During the thirteenth century and the fourteenth century a large hall was built on the site of the Experimental Station known as Orme Hall which was sited near the present Station packing shed. The Hall was demolished in 1818 but it was not until 1912 that the entrance gate was finally taken down. A number of Coats of Arms were found on the pillars of this entrance gate and on the roof of the building. In 1866 William Dennis came to Kirton as an agent for a London firm and amongst other activities he marketed potatoes. He later set up on his own account and by 1904 owned over 3,000 acres in Lincolnshire, including the land now occupied by the Experimental Station.

“In 1624 Sir Thomas Middlecott was granted a Roll Charter to found a Grammar School at Kirton which was built on the site of the present laboratories. Hansard, who introduced the Parliamentary recording system, was one of its outstanding pupils. The Grammar School was rebuilt in 1853 and in 1905 science laboratories were erected and fully equipped. Kirton Grammar School held a unique position at the time because it was recognised as the only technical school for agricultural science in the Eastern Counties. The inclusive fees at this school were full board £10 per term, weekly board £9. 9 shillings, day tuition £1,5 shillings and games one shilling and sixpence.

“The school closed in 1917 and in 1919 the Trust adopted it as the headquarters of the Agricultural Education Department of Holland Lincs. County Council. At the same time the Council bought the College Farm, now the Experimental Station.

“In 1924 the College received its first students who paid five shillings a week. From the outset work was planned to cover advisory, education and experimental work. The staff included the Principal, Agricultural Advisor, Soil Chemist, Entomologist, Mycologist and Poultry Advisor. It was then known as the Agricultural Institute and Experimental Station.

“Free advice was available to farmers and growers throughout the country and experiments were conducted on the farm dealing with potatoes, sugar beet, cereals, peas, fruit, asparagus, spinach, pig feeding and other crops typical of those grown in the area. The institute was also a centre for the Royal Horticultural Society’s daffodil variety trials. This work was continued until 1947 when all the advisory services in the country were amalgamated in the National Agricultural Advisory Service directly under the Ministry of Agriculture, Fisheries and Food. The Institute became part of the N.A.A.S. and Kirton Experimental Station became a subsidiary of Terrington Experimental Husbandry



Tulip field, South Lincolnshire

Photo: Author

Tulips at Spalding, 1961. Seymour Coble.

Photo: F. Sharpe





*Inspecting daffodils for quality
S.H.E. Springfields Horticultural Exhibition, 1983*

*Photo: Lingarden Ltd.
Photo: Springfields*



Farm continuing to deal with experiments on bulbs and vegetables. In 1964 the old Institute Farm became the Kirton Experimental Horticulture Station in its own right".

The story of Kirton's changing role as a centre of agricultural knowledge is a prime example of changes in government policy. The establishment of the Institute and its advisory role was the responsibility of the education services administered by the county council, a role it fulfilled for twenty five years until 1946. This service fitted in with the county council's policy of purchasing land and creating small holdings for the returning service-men after 1918.

My father returned from the artillery which showed him the wonders of Egypt, Mesopotamia and India, to marry and settle on thirty acres at Proctor's Farm, Pinchbeck West and he and his generation always referred to the establishment at Kirton as the Institute.

J.C. Wallace was the Principal in those years and in 1923 he and the Agricultural Education Committee issued its annual report which stipulated fees of five shillings a week for students resident in the county. The students were warned to provide themselves with "strong boots for field wear" and firmly preempting students unrest, intructed that they "must satisfy the Principal as to their diligence and keenness." No nonsense in those days.

The 1927 report offered residential courses and listed the experimental work, where potatoes and the new crop sugar beet featured, advisory service on local crops and problems, analysis of soils, manures and feedingstuffs (the early days of chemical fertilisers and balanced rations) and lectures.

As early as 1921 leaflets were issued on spring cabbage trials and lodging of cereals. The pamphlet published in October 1923 on the Control of Bunt (Smut) in Wheat by dressing the seed with formalin was entitled the 1st Extension Leaflet. This close link between education and advisory work was broken later in England though less so in Scotland and visitors to the United States and Canada find that the Extension (farm advisory) service operates directly from the colleges under the charge of the Dean of Agriculture. The revival of agricultural education in the development of further education in the county of Holland missed an opportunity to re-establish the old link when the Agricultural Centre of the College of Further Education was sited at Holbeach.

Principal Wallace continued to strengthen his team of agricultural scientists until 1930 when bulb experiments were started and D.E. Horton began a long career in bulb research and advisory work. In 1935

glasshouses were erected with the help of subscriptions from the industry and experiments on the forcing of bulb flowers commenced.

In 1946 the advisory and experimental work was taken over by the Ministry of Agriculture and after a period as a satellite of the Terrington Experimental Farm, Kirton was finally given independence as a Horticultural Station in 1964 when the first chairman of its advisory committee was D.V. Konynenburg. He was followed in 1966 by W.E. Grant who served until 1982.

The first Director under new regime was George Baines under whose guidance for fifteen years the station steadily built up a reputation for its work on bulbs and vegetables. Succeeding director Don Gilbert and the present Ian Sandwell have added to that reputation. The bulb work has been ably conducted by a devoted team from Mrs.E. Turquand, Jim Briggs, Malcolm Millar to Gordon Flint and Ian Norris today. One name esteemed throughout the bulb industry is associated with Kirton — that of Arthur Moore. Arthur served for many years as a bulb expert under the advisory arm of A.D.A.S. in the county, progressed through the service to become the first National Bulb Advisor and was able to play an influential part in the planning of the work at the Station until his retirement in 1982.

The bulb experimental work on the Station changes with the needs of the industry and apart from regular demonstrations and open days, panels of growers are consulted regularly in an endeavour to anticipate the needs rather than simply keep abreast of changes.

The early years were spent on manuring and cultural trials, pest and disease control with the accent on hot water treatment for eelworm control and chemical control of tulip fire. Later work on chemical weed control and temperature treatments for early forcing has been widely put into practice. The task of the Station is to translate scientific laboratory investigations into practical recommendations for use in the field and much of the basic work still has to be monitored and updated as new techniques and materials are evolved. Current work is now looking at further mechanisation, cost saving, bulk handling and storage with some completely new investigations into rapid multiplication.

While the work is production orientated, the ultimate benefit is to the consumer because all work is assessed on the improvements in quality and marketability giving eventually a product which is either better in quality more reliable or just plain cheaper than it was before for the customer.

One other Experimental Horticulture Station in England is also carrying out experimental work on bulbs. This is at Rosewarne near Camborne in Cornwall where the major scope of work covers daffodils with the accent on early production of flowers in the field with some



May in Springfields Gardens

Photo: Springfields

Flower Parade. West Pinchbeck Village Float

Photo: Springfields





*Spalding Flower Parade. The Queens Float, 1966
Flower Parade. Trustee Savings Bank Float*

*Photo: Springfields
Photo: Springfields*



coverage of iris and lilies. A successful programme of breeding has been brought to fruition with many promising seedlings of narcissus, some released, many to be evaluated, and a very successful new type of anemone — the St. Piran strain.

The breeding of daffodils has been the labour of love of Miss Barbara Fry who is now on the point of retirement. How many of us would wish to leave behind us so many beautiful tributes to our life's work. She was awarded the British Empire medal for her work on bulbs.

Rosewarne has a sub-station on the Isles of Scilly which looks at the problems of growers on the islands especially the production of Sol d 'Or, with important progress in advancing flowering by flaming or covering the flower beds and in introducing virus free stocks.

Both experimental stations are located in the main bulb growing areas but can call on the services of regional experts in physiology, pathology and entomology when needed and have access to special assistance such as electron microscopes, and mathematicians skilled at the layout of experiments and the analysis of results by computer.

Further backing to the research programme is given at research institutes where the work is both "applied" to specific problems or diseases and "fundamental" in investigating exactly how and why the physiology of a plant behaves as it does. The research for bulb and hardy ornamental crops is based at the Glasshouse Crops Research Institute at Littlehampton in West Sussex where the director, Dr. Derek Rudd-Jones, C.B.E., heads a staff which includes many names well known in bulb circles, including Drs. Alun Rees, David Price, Alan Brunt and Olwen Stone.

The board of governors of G.C.R.I. includes one grower member appointed from the bulb growing industry and contacts are maintained by open days at the Institute, through the medium of the G.C.R.I. Association open to grower members and by close co-operation by the staffs of the Institute and the experimental stations.

In this way institute staff are involved in the planning of experimental work at Kirton and Rosewarne and can give scientific back up or be involved in the development on a field scale of their own laboratory work. Examples of this collaboration at present are investigation into fusarium (base rot), neck rot, use of chemical treatments to induce early flowering, and the transfer of virus — free stocks of narcissus from the clinical condition of the laboratory to the open field, at the same time multiplying them as rapidly as possible.

Overall responsibility for planning and funding research and experiments lies jointly with the Agricultural Research Council (Institutes) and the Chief Scientist's Department of The Ministry of

Agriculture, Fisheries & Food (Experimental Station) with both funding some basic research at universities. The priorities of research are determined by the J.C.O. (Joint Consultative Organisation) through which both sponsors consult with scientific specialists and representatives from the industries concerned.

For each crop or section of interest such as food processing the J.C.O. has recently introduced a review by an ad hoc committee once every four years to review progress and identify any changes required for the next few years. e

A J.C.O. committee considering Hardy Nursery Stock and Bulbs reported at the end of 1981.

A direct result of the research work of the last decade has been the production of virus-free stocks of daffodils at G.C.R.I. Several commercial varieties have been grown for at least fifty years by vegetative reproduction. There are a dozen or more known viruses in narcissus, some very difficult to detect, which can be reduced by rigorous roguing but even good clean stocks may carry a number of viruses which show little or no symptoms.

By culturing tiny meristem tips, virus free plantlets can be grown. Work on Sol d'Or, the early flowering variety of the Sillies, showed great improvements in vigour and flower quality and stocks were built up and released to the islands. Further work started on virus free material for several mainland varieties. This raised the question of how to release these new improved stocks fairly among the hundreds of growers. To prepare for this the Nuclear Stock Association (Bulbs) was formed in 1979 to arrange multiplication and distribution and its members fund the cost of isolating and growing the virus free material when it leaves the laboratory. A similar N.S.A. in Scotland is funding the multiplication of stocks from the Scottish Crops Research Institute.

The dissemination of information from researchers to growers is a subject widely criticised. However there are many channels open for those who take trouble to keep abreast. Gone are the days of trade secrets. There are abundant press articles, technical advisors, open days, A.D.A.S. lectures, reports on experiments published and for the erudite, scientific papers are published.

However there is another very active centre for the exchange of new information open to all and this is the South Holland Growers Club. This club has members with wide horticultural interests, meets on a social basis, invites scientific and other speakers, has a special interest in bulbs and flowers and arranges visits to leading growers in this country and on the continent.