

**BRITISH ORNAMENTAL PLANT
PRODUCERS
ACCREDITATION SCHEME
CODE OF PRACTICE**

**HARDY ORNAMENTAL NURSERY STOCK PRODUCTION
2003
Version 1**

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INTRODUCTION

This Code of Practice and the accompanying sample manual form the basis of an accreditation scheme. The code is the main document from which growers will produce their own nursery-specific manual. This nursery manual will take into account individual nursery practices and customer demands but will comply with all the conditions of the Code of Practice. The aim of the code and the nursery manual, via the development of quality management procedures, is to ensure the production and supply of quality plants thereby maintaining and developing customer satisfaction. Nurseries will use their specific nursery manual to comply with the British Ornamental Plant Producers Accreditation Scheme. Assessment will be based on nursery inspections to determine how the nursery produced manual complies with the Code of Practice document and how the nursery working practice complies with their own manual.

The Horticultural Development Council and BBPA have funded the establishment of the bedding and pot plant accreditation scheme from which this scheme is derived.

This code is designed to formalise good nursery practice.

The Code of Practice is separated into 3 main sections:-

- 1) Strategic issues.**
- 2) Production issues.**
- 3) Customer related issues.**

The term '**MAJ**' at the end of the paragraph indicates that failure to comply with the item(s) would be considered a major non-conformity. Failure to comply with items without this suffix would be considered a minor non-conformity. See Scheme Rules for further details.

1.0 STRATEGIC ISSUES

1.1 HEALTH AND SAFETY

1.1.1 FEPA requirements

a). Training and provision of advice

As a minimum requirement, existing staff born after 31 December 1964 carrying out operations involving pesticide usage must all hold the relevant National Pesticide Training Council (NPTC) Foundation Module (PA1) and certification for the specific application method unless under the direct and personal supervision of a Certificate holder. Copies of all certificates must be held on record for reference. Staff born before 31 December 1964 that do not have the NPTC qualification must still be able to demonstrate evidence of specific training in the use of pesticides. **MAJ**

New staff (those employed after accreditation is gained) involved in pesticide application must all hold relevant certification. **MAJ**

All pesticide advice supplied to the business by outside organisations must be from personnel who have appropriate BASIS qualification and ideally belong to the BASIS Professional Register. Copies of all certificates must be held on record for reference. Where external advice on the use of pesticides is not used, then evidence of grower competence must be available. **MAJ**

b). Pesticide storage and use

Pesticides must be safely and appropriately stored in a store or cabinet of approved design (See Appendix 1). Pesticides must be kept in their original containers. Alternative containers must only be used in the case of breakage / damage, when a label must be applied to the new container. **MAJ**

An inventory of pesticides in store must be maintained, documented at least monthly and reconciled annually. Only pesticides with the appropriate recommendation (off-label and extrapolation included) must be stored and used. Pesticide storage and use must follow the FEPA Pesticide Code of Practice. Records must be maintained of all pesticide applications (including the use of soil / compost sterilants). The records must be of sufficient detail and cover the following parameters; product(s) applied, quantity applied, dose

rate, method of application, size of area treated, application pressure, crop type and variety, location, date of application, operator name, re-entry time, and justification for application. The records must be signed by a technically responsible individual who authorises the application. Appropriate protective clothing must be provided, worn and stored correctly. There must be clear instructions available for staff regarding what level of protective clothing should be worn. Protective clothing and equipment must either be cleaned or discarded directly after using pesticides. Respirator filters must be checked regularly. The pesticide mixing area must be sufficiently equipped (see Appendix 1). Jugs and scales must be verified or calibrated as necessary. Spray application in progress warning signs and re-entry signs must be appropriately displayed. Where an official collection and disposal system is used for empty pesticide containers there must be documented records of participation. **MAJ**

Each nursery will operate according to an annual integrated crop management plan approved by a BASIS qualified adviser. The plan will aim to minimise the use of harmful pesticides and encourage cultural, biological and natural control methods where possible. Pesticide application must be targeted according to the problem and based as much as possible on supervised control involving pest and disease monitoring rather than routine treatment. To minimise the potential for resistance or tolerance by the target pest, disease or weed, spray programmes must be based around the use of various different active ingredients.

Where plants are exported there must be documented evidence that any pesticides used do not contravene restrictions in the country of destination.

Buffer zones ('no spray' buffer zones) must be in place to protect local water courses and Local Environmental Risk Assessments for Pesticides (LERAPs) must be undertaken as appropriate. **MAJ**

1.1.2 **COSHH assessment**

All operations must be assessed for potential hazardous substances and appropriate control measures put into place. A written copy of the assessment must be made readily available to all staff. The assessment must be reviewed on an annual basis. **MAJ**

1.1.3 **Health and safety policy and assessment**

a). Policy

Any nursery employing more than 5 staff must have a written Health and Safety policy. It must state management's attitude to health and safety matters and indicate how the business is organised to address the issue. **MAJ**

b). Assessment

Specific risks that must be assessed include:- working with machinery, materials handling, fork lift and tractor driving and roof working (e.g. maintenance and cleaning). A general nursery hygiene risk analysis must also be undertaken. The assessment must be reviewed on an annual basis. **MAJ**

1.1.4 **First aid**

The nursery must have a nominated person to take charge in an emergency. An adequate number of trained first aiders must be available, for a 'medium risk' enterprise, employing between 20 and 100 staff, the recommended ratio is one first aider for every 50 employed. First aiders must have received the correct HSE approved training and possess a valid first aid at work certificate. An adequate number of first aid boxes must be available on the nursery and notices must be put up informing staff where the first aid box(es) is / are located and the appointed first aider(s). Complete first aid kits must also be available during field work. Nursery accident and emergency procedures must be displayed and understood by all employees. **MAJ**

1.2 **ENVIRONMENTAL POLICIES**

The business should have an environmental policy and practice efficient resource management for both environmental and commercial reasons. The policy will cover:-

1.2.1 **Environmental and wildlife conservation**

An audit of the immediate environment should be undertaken to ensure areas of existing habitat (hedges, field margins, ponds, watercourses, ditches etc) are responsibly managed and maintained. There must be a documented conservation plan that encompasses the following areas; sustainable production methods, animal and plant diversity, actions to avoid habitat destruction / deterioration and bio-diversity enhancement.

1.2.2 **Peat and its alternatives**

Peat should be sourced from non - SSSI sites. Written evidence of this will be required. A commitment to assessing potential alternative substrates for use in peat-free or reduced-peat mixes should be made and the actions recorded. Where appropriate, customers should be informed of cultural, environmental and financial implications of their use.

1.2.3 **Energy use**

Every nursery should have completed an Energy Audit to monitor energy use and improve efficiencies. Areas to be assessed should include the following items;

- a) Review of current fuel usage (oil, gas, electricity etc) compared with previous year's figures.
- b) Maintenance of plant and machinery.
- c) Insulation of plant and machinery.
- d) Transport vehicles.
- e) Heat distribution system design (as appropriate).

The audit should be reviewed annually.

1.2.4 **Water supply and use**

The design and use of irrigation systems should minimise water wastage. Methods should be adopted to predict the crop requirement for water. Irrigation of outdoor crops should take into account predicted and actual rainfall and evaporation rates. The DEFRA Code of Good Agricultural Practice for the Protection of Water (revised 1998) should be followed. Records of water consumption should be maintained and the water should be analysed annually for pH, carbonate and mineral content. Water should only be extracted from sustainable sources and there should be documented records to show authorisation for water abstraction.

1.2.5 **Pollution safeguards**

Fuel, acid, pesticides and fertilisers must all be stored in accordance with the DEFRA Code of Good Agricultural Practice for the Protection of Water (revised 1998). If appropriate, nurseries must abide by the relevant Nitrate Vulnerable Zone legislation. **MAJ**

All fertiliser applications to the soil should be based on a nutrient analysis of the soil. Nutrient levels in nursery run-off should be kept to a minimum. Any boiler plants should be regularly maintained to minimise airborne pollution. The nursery should comply with The DEFRA Codes of Good Agricultural Practice for the Protection of Air and Soil (both editions revised 1998).

When organic manures are stored on site, the storage should be in a designated area, at least 25 metres from a water course. Applications of organic manure should be based on a nutrient management plan which should document nutrient applications and application timings.

Untreated human sewage must not be used. If treated human sewage is used then use should comply with 'The Safe Sludge Matrix'.

1.2.6 **Environmental pollution**

The impact of the nursery on the local environment should be considered. e.g. pollution, noise, smoke, dust etc. The method of disposal of pesticide waste and washings should be described. If washings are disposed onto land then the nursery must have authorisation from the Environment Agency under the Groundwater Regulations. A Pollution Audit detailing the points in 1.2.3 to 1.2.6 should be prepared and reviewed on an annual basis. The audit should highlight potential areas of pollution and the methods employed to minimise any pollution risk.

1.2.7 **Recycling**

Businesses who are part of the packaging chain, have an annual turnover greater than £2 million and handle more than 50 tonnes of obligated packaging material must conform to The Producer Responsibility Obligations (Packaging Waste) Regulations 2002. The amount of packaging that must be recovered or recycled will depend upon the nursery activities and the percentage obligated, calculated from the recording system. **MAJ**

Recycled and recyclable materials should be used where possible, provided this does not increase pest and disease risk. Waste material e.g. plastic (hard plastics and films), cardboard and metal should be recycled wherever possible.

1.2.8 **Waste and waste disposal**

All waste products (green waste and general waste) should be identified on the nursery. A waste audit should be carried out to document all possible waste products. This should include a plan for reducing wastage and evidence that actions have been carried out. There should be no disposing of plant material (green waste) within 10m of production areas unless in a purpose built, covered, composting unit. An assessment of nursery green waste should be carried out to conform with The Code of Practice for the Management of Agricultural and Horticultural Waste. (The purpose of the code is to prevent the spread of quarantine pests and pathogens in nursery waste material, plant material, soil, compost etc).

General waste that cannot be recycled must be regularly disposed of from the nursery into licensed tips. Skips must be covered to prevent the dispersal of pests and diseases around the nursery. The duty of care must be legally passed to the contractor. **MAJ**

1.3 **MANAGEMENT STRUCTURE AND RESPONSIBILITIES**

1.3.1 **Management structure**

Each nursery must state its management structure showing areas of responsibility, contact staff for major customers and contingency plans for absences. (An example of a typical structure is presented in Figure 1). **MAJ**

1.3.2 **Communications**

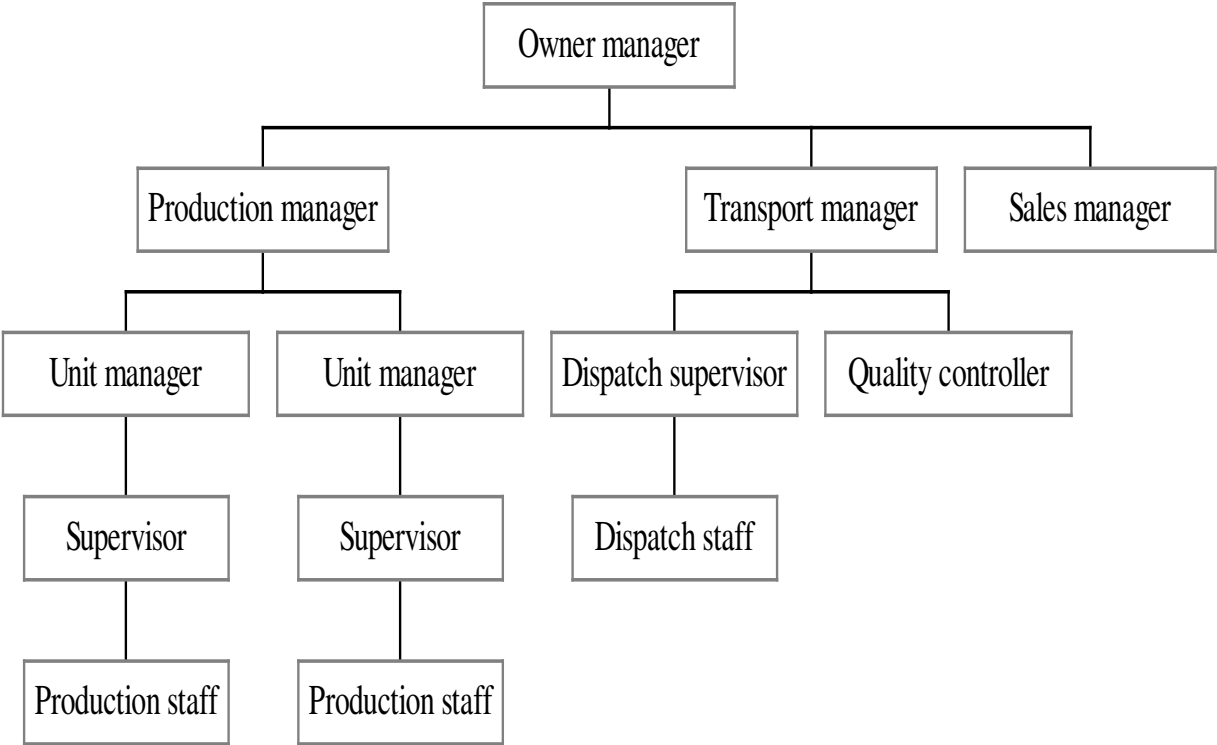
These should be formalised throughout all levels of the business and follow the management tree to ensure that all staff are familiar with reporting and responsibility pathways. The methods employed for contacting key staff on the nursery or production areas should be described.

1.4 **QUALITY MANAGEMENT POLICY**

All businesses should have a written statement outlining the company's quality policy.

Figure 1

Management Structure



1.5

EMPLOYMENT REQUIREMENTS AND STAFF TRAINING**1.5.1 Employment legislation**

There is a wide range of employment legislation which impacts upon recruitment and the way people are managed during employment. Some of it depends on how many people are employed and some on the length of service of the employee. At least one person should be assigned to deal with human resource issues and given the facility to obtain professional advice when required. The current main legislation which must be taken into account includes;

- a) Equal Opportunities legislation during recruitment and employment (including: The Sex Discrimination Act, The Race Discrimination Act and The Disability Discrimination Act).
- b) Agricultural Wages Order
- c) Working Time Regulations
- d) National Minimum Wage
- e) Employment Relations Act
- f) Human Rights Act
- g) Asylum and Immigration Act
- h) Equal Pay Act
- i) Part-time Workers Regulations
- j) Stakeholders Pensions (for businesses with 5 or more employees)
- k) Rehabilitation of Offenders Act
- l) Health and Safety legislation.

Evidence of compliance must be available.

1.5.2 Employment documentation**a). Statutory requirements**

All staff must receive a Statement of Particulars of Employment within 8 weeks of commencing employment, the Statement should be signed by both the employer and employee.

All staff must receive an itemised pay slip.

A record must be kept of all staff that work over 48 hours per week. It is advisable that these members of staff should be asked to sign an 'opt-out' form.

If 20 or more staff are employed a disciplinary policy and procedure must be in place.

If 5 or more staff are employed provision for stakeholder pensions must be in place.

An employer must ensure that all their workers are legally entitled to work in the U.K. **MAJ**

b). Good practice

A policy covering the following areas should be in place;

- a) Recruitment / promotion
- b) Induction
- c) Staff training (outlined in section 1.5.3)
- d) Staff appraisal (outlined in section 1.5.3)
- e) Absence
- f) Discipline (if less than 20 employees)
- g) Redundancy

1.5.3 Staff training and appraisals

All companies should have a written training policy and programme and should keep training records. All staff should be given training as appropriate to carry out their tasks. Formal on-going training should be given to staff operating dangerous or complex equipment. Training programmes should cover both technical / cultural operations training (e.g. for those involved in day to day cultural operations) and interpersonal skills training (e.g. for supervisors or managers). Training can be both "in house" and external. For large or multi-site nurseries, staff manuals / training handbooks should be issued to each permanent member of staff. Job descriptions should be in place for key staff. Reviews or appraisals should also be carried for key members of staff on a regular basis.

1.6 **INTERNAL AUDITS AND OR MEETINGS**

Regular meetings should be held for management to review performance against quality objectives. Specifically, nursery response to customer complaints and queries should be reviewed and actions recorded. Copies of past audits should be kept along with evidence that corrective actions have been implemented.

2.0 **PRODUCTION ISSUES**

2.1 **CULTURAL CONSIDERATIONS AND HYGIENE**

2.1.1 **Site selection and preparation**

In the case of field grown hardy ornamental nursery stock, a documented pre-planting assessment must be undertaken to ensure any new site is suitable for production. The assessment must include;

- a) a review of any site specific physical limitations (eg drainage)
- b) a soil analysis (including chemical and physical assessments)
- c) a perennial weed assessment of the site
- d) a potato cyst nematode analysis if crops are to be exported
- e) previous cropping history

Where appropriate, crops must be grown in a rotation system, for example, there must be a minimum break of 3 years between rose crops grown on the same piece of land. **MAJ**

Potential soil erosion should be minimised by the use of appropriate cultivation techniques. Any fertiliser applied pre-planting should be based on a nutrient analysis of the soil. The site should be free from weeds at the point of planting. Herbicides which may damage subsequent crops must not be used.

The use of soil fumigants should be justified in writing, the use of methyl bromide is not permitted after January 2005.

2.1.2 Nursery site

Weeds must be controlled over the nursery site as a whole and all grassed areas well managed. Special attention must be paid to the area immediately around protected structures and standing down areas. To prevent weed development around protected structures there must either be;

- a) a vegetation free strip (conventional herbicide strip),
- b) a strip of weed free, closely mown grass or
- c) a vegetation free strip, covered with an inert material such as gravel, chippings, Mypex etc.

In the case of new or rented sites a documented risk analysis must be undertaken prior to production. All aspects of production on rented sites, which are directly controlled by the grower, must conform to the Code of Practice. **MAJ**

2.1.3 Production areas

Each field or protected structure must be defined in documented records and identified with a unique number or code. Both field sites and container production areas must be kept free from weeds, crop debris and unmarketable product. **MAJ**

2.1.4 Delivered product

Product should be dispatched from the nursery on clean delivery trolleys / containers. Returned trolleys should be checked on arrival and cleaned where necessary.

2.1.5 Production materials

Growing media, fertilisers and other growing media ingredients used in the production of protected container grown hardy ornamental nursery stock must be kept in some type of covered storage (compost incorporated pesticides must be stored in the pesticide store). Growing media destined for use with outdoor container grown hardy ornamental nursery stock must also be covered (under permanent or temporary cover) unless used within 2-3 days of delivery, in which case potential routes of growing media contamination (e.g. weed seed, disease contamination) on the nursery must also be assessed. **MAJ**

Pots must either be stored inside or in the original water proof packaging if outside. Pots and packaging must be stored in a location away from rodent, bird, physical or chemical contamination. **MAJ**

Water tanks and any outside dilute feed tanks must be covered. Reservoirs need not be covered but surrounding embankments must be maintained to prevent weed seed contamination. Fencing for security and safety purposes must be used around reservoirs and where appropriate signage indicating deep water must be displayed. **MAJ**

2.1.6 **Vermin**

Animals such as mice, rats, birds and rabbits should be kept under control throughout the nursery using legal methods. Any traps and baits should be inspected regularly and be kept covered. A note of the trapping / baiting sites should be made.

2.1.7 **Visitor arrangements**

Customers and other visitors should be encouraged to make appointments so that they can be accompanied on site by an appropriate member of staff. The office, reception or contact point should be clearly indicated where applicable. Car parking facilities should be available.

2.1.8 **Staff arrangements and facilities**

As a minimum, on site living quarters should be habitable and clean with the required basic services and facilities. Adequate canteen and wash facilities away from production areas should be available for staff. Staff should be aware of the hygiene rules and practices (nursery, personal and plant) which should be written down and be prominently displayed on the nursery. Staff permitted to raise their own plants on the nursery must fully comply with the hygiene and health standards required for commercial production.

2.1.9 **Material storage on site**

Production materials and infrequently used nursery items should be stored safely and tidily on site. Storage of defunct or unwanted items should be minimised.

2.2

CLEANING

2.2.1 Between batches

After an area has been cleared of marketable plants, it should be cleared of unsaleable plants and debris and the surface cleaned. Where stock yet to make saleable remains, batches should be blocked up tidily on a regular basis. Piles of debris should be dealt with by the end of each working day. Mypex or polythene should be swept or rinsed with water containing a little disinfectant. Any holes or tears should be repaired. If the covering is badly torn or dirty then a new layer should be used. If polythene is used it should be of a sufficient gauge to withstand normal traffic (+50µm). Capillary sandbeds should be cleaned and re-dressed / re-levelled as appropriate prior to restocking.

Under protection, floor coverings should be firmly fixed at the structure ends and walls and around posts and dollies so that no soil is visible. If done thoroughly it will prevent weed growth.

2.2.2 End of season / end of crop

Any remaining unwanted field grown hardy ornamental nursery stock should be lifted and burnt or disposed of appropriately, unwanted plant material should not be ploughed back into the soil.

In the case of protected hardy ornamental nursery stock, all sections of the cropping structure should be cleaned at least once a year. This will involve replacing floor polythene and cleaning or disinfecting Mypex / floor coverings / sandbeds as necessary. Cladding materials should be cleaned according to how dirty they are and, for glass structures, the inside should be cleaned with high pressure water and detergent as required.

2.2.3 Broken glass

As appropriate, glasshouse structures should be inspected on a regular basis for damaged glass. Unauthorised glassware should not be allowed into production or dispatch areas. Broken glass should be logged and the glass removed from the area along with contaminated product. The log should state the date and location of the incident, the reason for the damage, the amount of plant contamination and the follow up action taken.

2.3

PEST, DISEASE AND WEED CONTROL**2.3.1 Identification and training**

Pest and disease identification skills should be developed by staff training. All permanent supervisory production staff should be able to identify the following pests and diseases and / or their symptoms;

- a) Aphid.
- b) Two spotted spider mite.
- c) Caterpillar.
- d) Leafhopper.
- e) Vine Weevil (adult and larvae).
- f) *Botrytis*.
- g) Powdery mildew.
- h) Downy mildew.
- i) Black spot.
- j) Rusts.
- k) Root rot diseases.

Supervisory staff should also be able to identify a range of commonly occurring weeds such as chickweeds, groundsel, annual meadow grass, willowherb, bittercress, sowthistle etc. All staff should know who to report to when any of these problems are found.

2.3.2 Monitoring

All plants should be thoroughly monitored on a regular basis for signs of pests, diseases, weeds and physiological problems. Where appropriate, monitoring procedures should include the use of sticky traps and regular crop inspections. Records should be kept of the results of monitoring including details of pest and disease thresholds that require action.

Records must be kept of all pesticide applications (as outlined in section 1.1.1) and all biological applications should be recorded.

2.3.3 Biological control

Where used, the quality of biological control agents should be checked visually before application and any suspected defects notified to, and discussed with, suppliers. Staff applying biological control agents should be trained in the

recognition of parasites and predators and in application and monitoring techniques. If external consultants are used, they should be able to demonstrate their technical qualifications.

2.3.4 **Pest and disease outbreaks**

A procedure should be written down for dealing with notifiable or severe pest and disease outbreaks and weed infestations. The procedure should include;

- a) Steps to be taken to ensure rapid identification of the problem if cause unknown. This should take the form of specialist consultation and laboratory analysis if necessary.
- b) Informing the local Plant Health and Seeds (PHSI) Inspector if a notifiable pest or disease is suspected. Contact details of the local PHSI office and Inspector should be recorded.
- c) Isolating affected plants, preferably in an area as far away as possible from other plants.
- d) Clearly marking the affected plants so that staff will not inadvertently move or sell them.
- e) Prompt treatment of the problem and if a notifiable pest or disease is confirmed, full compliance with the schedule issued by the Plant Health Inspector.
- f) Arrangements for customers to be informed if the problem is likely to affect their orders.

As appropriate, companies should be registered with DEFRA for plant passporting purposes. Plant passports should be retained for at least one year. Rhododendron and viburnum species should be accompanied by plant passports. Where potential problems with pest invasions or pesticide spray drift are known to occur, nurseries should liaise with neighbouring businesses to prevent problems.

2.4

NUTRITION

2.4.1 **Growing media**

Growing media, whether own mix or proprietary, should have the following;

a). Own mix

Growing media mixed on the nursery should have a written 'recipe' including a specification of raw materials suitable for the designated use. This recipe should be followed by staff carrying out the mixing. A quality control system should be in place on the nursery to monitor the consistency of growing media produced, this system should consist of one or more of the following;

- 1) Out of each batch of growing media made (or once a week where frequent batches are made) a 0.5 litre sample should be taken, bagged, date labelled and stored in a cool place for the life of the crop.
- 2) An analysis for N, P, K, pH and EC should be taken routinely to check the recipe is being followed accurately and to monitor the performance of the mix.
- 3) A count of controlled release fertiliser pellets for a given volume of growing media should be undertaken periodically from different mixes as a spot check to ensure the correct rates have been added.

b). Proprietary

Bought-in growing media mixed to your own requirement should have a written specification.

The batch number of deliveries should be recorded, compost samples should also be saved and appropriately stored.

Manufacturers will supply their compost analysis results on request or will have a quality management system in place, such as ISO 9001.

2.4.2 Fertiliser use**a). Calculating quantities and record keeping**

Soil analyses should be undertaken before planting field grown hardy ornamental nursery stock. Analysis of the soil or growing media pH, EC and nutrient levels should be undertaken during the production cycle, the frequency of analysis depending upon the duration and condition of the crop. For longer term container grown crops, an analysis should be undertaken at the end of each season to determine residual nutrient levels in the growing media. Crop inspections should take place to establish nutritional deficiencies, appropriate action being undertaken to assess and rectify any problems encountered.

Fertiliser applications should be tied into a cropping programme to minimise nutrient loss and optimise the benefits.

A nitrogen management plan should be established which includes nitrogen analysis at the start and end of the crop or per site in a crop rotation system. This nitrogen analysis should be carried out once a year for permanent crops and prior to each crop in continuous cropping. The quantities of nitrogen applied should be calculated from the nitrogen management plan.

Fertiliser stock records should be maintained. The records should detail the quantities of feed in and out of store and be annually reconciled.

Batch numbers of fertilisers applied to the soil, mixed into the growing media (base fertilisers or controlled release fertilisers) and those used to make up liquid feeds ('straights' or proprietary mixes) should be recorded. Each application of fertiliser should be recorded detailing the date, crop / location, fertiliser type, quantity applied, concentration, method of application and applicators name.

b). Competency

Where advice on crop nutrition is sought, this should be obtained from a FACTS (Fertiliser Advisers Certification and Training Scheme) qualified consultant. Where FACTS qualified consultants are not used there should be documented evidence of appropriate training received in the use of fertilisers.

c). Fertiliser application equipment

Regular maintenance and calibration of application equipment / dilutors should be carried out and recorded. Records should be available.

d). Fertiliser storage

Fertilisers should be stored safely in areas that are safe, clean and dry, away from water sources, pesticides and plant material.

Concentrated acid must be stored in a locked area separate from any other material.

2.5

ROUTINE CHECKING, CALIBRATION AND RECORDING**2.5.1 Temperatures and humidities**

In the case of temperature sensitive crops, temperatures should be recorded either by environmental computer or manually. If humidities are recorded, the wick in the aspirated screens should be checked weekly and replaced when necessary. The screens themselves should be re-calibrated according to the manufacturer's recommendations. The filter and screen case should be kept clean.

2.5.2 Solarimeters

A solarimeter, if fitted, should be cleaned annually or more frequently if sited near the boiler chimney.

2.5.3 Other equipment

Equipment such as acid and chlorine dosers and pH meters should be serviced annually. The pH and alkalinity of treated water should be checked regularly by a trained member of staff.

2.5.4 Crop sprayers

Sprayers (especially tractor mounted sprayers) must be correctly calibrated prior to pesticide application and regularly maintained. The correct spray nozzles must be used. The correct in cab carbon filters must be used and regularly checked. Equipment calibration should be verified annually by an official scheme or individual that can demonstrate their competence. **MAJ**

2.5.5 Seed

Seed should be stored under appropriate conditions for the species in question. Records need to be kept of the species, variety, provenance and batch numbers for traceability purposes. Supplied or observed germination data should be noted so that sowings will always produce the desired plant numbers. Where seed treatments are used, there should be records detailing the product used and the target pest or disease.

2.5.6 Cold storage facilities

Where stored, plant material (rootstocks, dormant lifted plant material etc) should be kept at appropriate storage temperatures and either bagged and / or appropriately wetted down to avoid desiccation. Store temperatures and

conditions should be monitored and recorded. There must be documented evidence of annual servicing of stores.

2.5.7 **Traceability of inputs**

Details of all major crop inputs should be recorded and available in the event of problems. This includes all plant material including; seed, cuttings, plug plants or liners, rootstocks, bud-wood, bare-root plants and containerised plants, pesticide sprays or dips applied, nutrients provided and growing media ingredients.

Where plant material grown possesses plant breeders rights, any requirements of the rights should be adhered to.

2.6 **PRODUCT QUALITY**

2.6.1 **Production processes**

All critical stages of the production process should be identified so that the quality of the plants can be checked throughout. Staff responsible for quality at each of the key stages should be identified and written best practices established. (Examples of production plans are presented in Figures 2 and 3).

2.6.2 **Establishment and product uniformity**

There should be stated nursery standards for the stage of development and establishment of product that is sent out of the nursery. Plants should not be offered for sale if the minimum standards (height, pot cover, number of breaks etc) and freedom from weeds (including moss and liverwort) pests and diseases cannot be met.

2.6.3 **Specifications**

The aim should be to give customer satisfaction with reference to the size and habit, suitability of container type and delivery timing by week number of the plant. Plants sold should meet customer specifications whenever possible and these specifications should, where given, be checked for acceptability to both the nursery and the customer. There should be written agreement between customer and grower, demonstrating agreement on quality specifications when specified by the customer. There should be proof that quality specifications are adhered to. Where varieties or rootstocks are agreed with customers there should be a written agreement demonstrating this. At the earliest opportunity,

Figure 2

Production Process and Responsibility Field Grown Stock

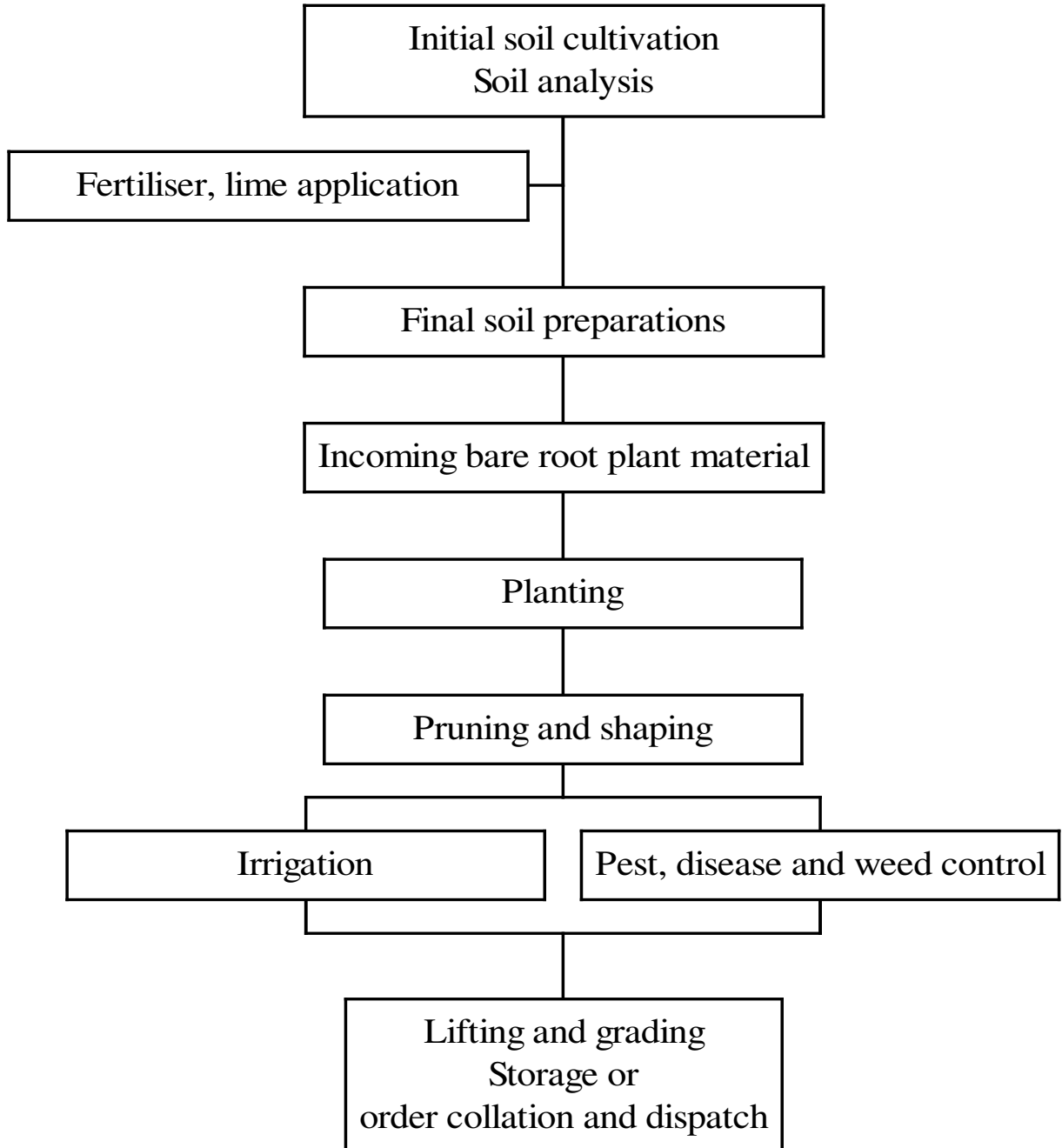
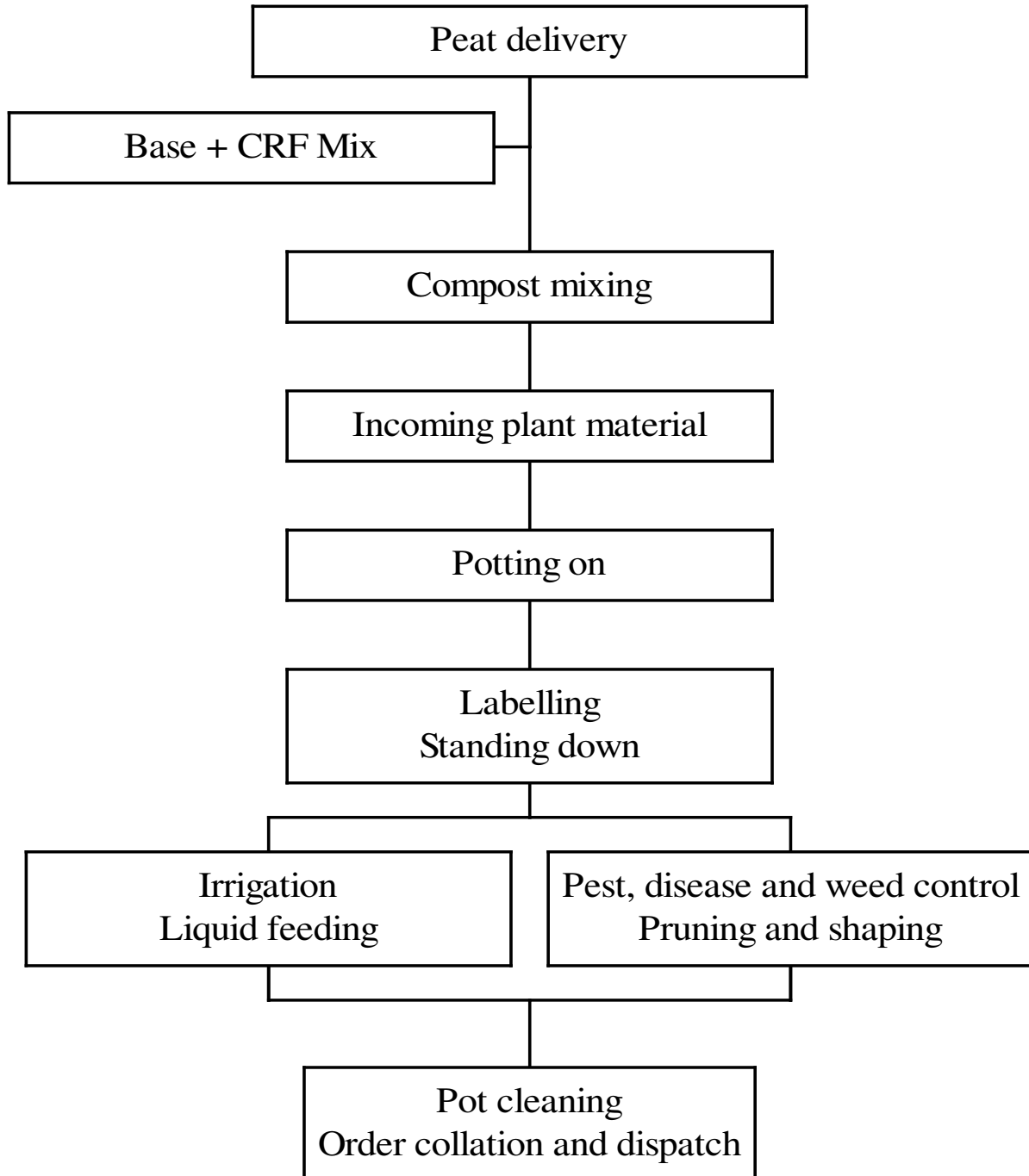


Figure 3

Production Process and Responsibility Container Grown Stock



the customer will be informed of any possible deviation from specification, lack of availability or amended date of supply. It is the responsibility of the nursery and their customers to agree realistic and achievable specifications.

Samples' when supplied to customers should be typical of the rest of the crop and safe to handle. All customer specifications should be treated as confidential.

2.6.4 **Product development**

Products should be checked throughout the product development process to ensure that they comply with any legal requirements and that they meet acceptable performance levels for the end user. A product development file should be kept if customers require it.

If a product is developed in conjunction with one specific customer, then this information should be kept confidential by both parties for an agreed length of time.

2.6.5 **Bought in plant material**

There should be documented checking and recording procedures (including documented quality certification where available) for all bought-in plant material. Records should be available for inspection. All material arriving on the nursery should be inspected for pests, diseases and weeds, quantity and quality and signed for by the member of staff responsible before the end of the working day. Records of pesticide treatments applied by the supplier during the plant propagation stage should be available upon request from the supplier.

2.6.6 **Sub contractors**

The nursery should take full responsibility for ensuring that the plants it markets which have been grown by another nursery business, whether under contract or verbal agreement, meet the required specification and quality standards. This should be achieved by a process of supplier auditing.

It is the responsibility of the nursery to audit all its contract growers contributing more than 1% (on an individual basis) towards the total nursery sales figure. (An example of an audit report form is presented in Appendix 2). The audit report forms should be available for inspection. No audit will be deemed necessary if the sub-contractor is a current member of another

recognised quality management scheme, for example EUREPGAP or MPS-GAP.

Contract growers contributing less than 1% towards the total nursery sales figure must be registered on a nursery approved supplier list. This list, based on a regular quality assessment of incoming plant material, will be maintained by the nursery.

2.6.7 **Spot buying (irregular purchasing of finished plant material)**

Where spot buying is practised, the business should take full responsibility for that product under the accreditation procedures. Any plant material should pass through the appropriate nursery quality control checks before dispatch to the final customer. As full a production record as possible should be obtained from the supplier. Where there is any doubt about the health or quality of the product, it should be inspected by an independent expert and a short report produced.

2.7

LABELLING

The following types of label should be included depending upon customer requirements and type of order;

a). Customer batch labelling

This is intended for plants grown on contract. The label should include variety details, customer details such as number of plants ordered.

b). Batch / traceability labelling

This is required for traceability purposes. The traceability label should be the means whereby all the relevant production information (especially inputs) can be traced for an individual plant or batch of plants. If batch labelled, and the batch is divided, then each part must be labelled. **MAJ**

c). Consumer labelling

This is intended for retail units and should be accurate whether generic or specific and should have a minimum of one label per unit sold or as required by the customer. All retail labelling should follow the poisonous plant labelling requirements given by the HTA.

The methods adopted must meet the following customer requirements;

- a) From labelling to the point of sale it must be possible, through the use of nursery records as necessary, to identify the type of starting plant material (seed, cuttings, plug plants or liners, rootstock, bud-wood, budded bare root material etc), plant variety, sowing / sticking / planting / budding / potting dates, growing media and nutritional inputs, any pesticide application and the dates of the main nursery operations.
- b) Batch labelling should be carried out during the production process in such a way that ordered batches can be monitored as required by customers. A batch can be created at any stage from sowing / planting to potting prior to sale.

It is acceptable to combine batch and point of sale labelling provided this meets the customer's needs. The essentials of any system are that all plants should be traceable as far back in the production process as practicable, and it must be possible to identify the key inputs (set out in (a)) relating to production on the nursery.

3.0 CUSTOMER RELATED ISSUES

3.1 PRODUCTION PLANNING AND CONTROL

Nurseries should have accurate production plans covering both field grown and containerised / container grown stock as appropriate. Production plans should detail plant numbers to be produced, cultural operations to be undertaken and appropriate marketing periods. Stock control systems should be in place to show what product is, and will be, available. All systems must have flexibility to allow re-scheduling. When exporting, plant material should conform to all the legal requirements of the country of destination.

3.2 TRANSPORT

3.2.1 Customers own transport

If the customers own transport is used, receipt of the goods is deemed to be at the point of dispatch.

3.2.2 **Third party transport and nursery transport**

Unless the customers transport is used, it is the responsibility of the nursery to ensure that the plants arrive at the customers site in good condition and that there are adequate insurance arrangements. The nursery will deal with any disputes with its haulier.

3.2.3 **Delivery records**

a). Order collation

Before delivery, the nursery should have confirmation from the customer of the requirements of packing for the plants and the method of unloading. There should be a positive written release of 'made up' orders from the nursery to avoid incomplete orders being dispatched.

b). Delivery note

Dedicated appropriate transport should always be used. Each delivery of plants should be accompanied by a delivery note. This should include a detailed description of the load and transport used along with details of the times of loading and delivery and trolley / stillage / container numbers. There should be space on the form for the driver and the customer to write any comments on.

c). Invoicing

Appropriate invoicing procedures should be in place. Invoices should tie in with delivery notes.

3.2.4 **Delivery details**

All drivers whether employed by the nursery or by a haulier should be aware of the procedures and care needed in the transport of plants. Clear written instructions are required.

The driver should be aware of the location and quantity of the different products in the load and be given adequate directions to the customer including any hazards in access.

The unloading of a delivery should not commence until an authorised person to receive the load is present at the customers premises, unless otherwise agreed. The driver should be given the name of the authorised personnel

before arrival at the site where possible. Customers should be advised of delivery details at least 24 hours in advance.

3.2.5 **Delivery conditions**

a). Bare-root plants

Bare-root hardy ornamental nursery stock should be delivered in covered vehicles to avoid root desiccation. Plants should be transported safely and securely in bulk containers. Plant material must not be allowed to freeze during transit. Plants should be on the vehicle for as short a period as is practicable so as to avoid any deterioration in plant quality.

b). Container grown plants

Container grown hardy ornamental nursery stock should be transported securely on trolleys / stillages in covered vehicles with due consideration given to ease of handling and maintaining plant quality throughout dispatch. No plant material should be in the darkness more than 48 hours if critical. Unless temperature sensitive, plants should be transported at ambient temperatures. In the case of temperature sensitive species, material should be transported between 5-10°C. The moisture status of the growing media at delivery should be sufficient to last the plants at least 24 hours under normal conditions. There should be sufficient headroom above plants on trolleys / stillages so that product is not damaged and there is adequate air circulation. Orders should not be prepared and placed on trolleys / stillages more than 48 hours before dispatch. There will be procedures to check trolley return and cleanliness and deal with plant returns.

3.3

SHELF LIFE / RETAILER / GARDEN PERFORMANCE

The expected shelf life of finished plants should be agreed with the customer and stated. Agreements should be based on the supply of healthy (pest, disease and weed free) plant material, of the required size / growth stage / condition based on the time of year and reasonable standards of care by the retailer. Containerised stock should be supplied with adequate nutritional levels.

3.3.1 **Nutrition**

The nursery should demonstrate how they ensure they provide adequate plant nutrition to maintain quality once the plant has left the nursery. This procedure should be linked to a shelf life target in the product development file. The volume and nutrition of growing media should be appropriate to the

size and stage of plant growth bearing in mind the maintenance of quality through the marketing chain.

3.3.2 **Acclimatisation**

The nursery should ensure that certain products at specified times of the year have an appropriate period of acclimatisation i.e. hardening off.

3.3.3 **Retailer information**

The nursery should be able to provide retailer and customer information about product care if requested.

3.3.4 **Species**

Pest and disease susceptible species and varieties should be avoided unless they are by specific customer request.

3.4 **CUSTOMER QUERIES**

3.4.1 **Complaints policy**

The nursery must have a formal and written complaints policy and must nominate staff who are responsible for ensuring the policy and procedures are carried out. All complaints and the actions taken must be recorded. **MAJ**

3.4.2 **Query / complaint procedures**

An answerphone should operate on the nursery if there is no one available to deal with queries or complaints. Complaints should be acknowledged within 12 hours of their receipt and the customer given a date when the nursery will report back.

3.4.3 **Complaint review**

The nursery should demonstrate that they regularly discuss the outcome of all complaints received and modify practices if necessary.

3.4.4 **Returns and out of specification products**

Any returned product that may contaminate existing stock should preferably be destroyed, otherwise it should be treated to remove the contaminant before it is placed back with production stock.

The nursery should have a written policy regarding returns, credits and out of specification products. There should be designated responsibility for returned product, which initially, should be held separately from growing stock. There should be clear labelling of rejected or out-graded product. This should include customer returns and internal rejects. Brand identification should be removed from all out-grades.

3.5

SECURITY

Nursery security procedures should be such that they avoid production and supply problems and there should be at least one nominated person responsible for nursery security. All visitors should be instructed to report to the main reception office whose location should be clearly signed. Ideally, visitor car parking should be available and clearly signed. No visitor should be allowed access to the production areas unaccompanied. Night time security should be adequate and if the nursery is isolated and unattended at night then an intruder alarm should be fitted.

Information stored on computers should be backed up on a regular basis and stored securely.

3.6

TRADING CONDITIONS

3.6.1 **Insurance**

Each nursery must take out Public Indemnity Insurance. **MAJ**

There should be a basic documented contingency in the event of a major loss e.g. glasshouse storm damage or major crop loss due to equipment failure. This should include;

- a) Insurance where considered viable.
- b) Procedure for identifying and contacting potential alternative suppliers who could meet customer requirements.
- c) Procedures for instituting repairs, rebuilding etc.
- d) Procedures for providing additional production facilities at short notice.

3.6.2 **Terms and conditions**

The terms and conditions under which the company trades should be supplied to all customers. However, where the nursery might be required to accept the suppliers or customers terms and conditions, it should be clearly established whose conditions apply in advance.

4.0 USEFUL SOURCES OF INFORMATION

Publications

Code of Practice for the Safe Use of Pesticides on Farms and Holdings (Green Code). Available from DEFRA Publications.

Code of Good Agricultural Practice for the Protection of Air (The Air Code 1998). Available from DEFRA Publications.

Code of Good Agricultural Practice for the Protection of Water (The Water Code 1998). Available from DEFRA Publications.

Code of Good Agricultural Practice for the Protection of Soil (The Soil Code 1998). Available from DEFRA Publications.

The UK Pesticide Guide. Published annually by CABI Publishing and BCPC.

Using Pesticides. A complete guide to safe effective spraying. BCPC.

Health and Safety Model Risk Assessment for Horticulture. Available from the NFU orderline for members. (Document number 063).

Essentials of Health and Safety at Work. HSE Books. ISBN 0-7176-0716-X (£5.95).

First Aid at Work, your questions answered. HSE Leaflet IND(G)214L 3/97 C500.

Control of Substances Hazardous to Health Regulations 2002. Approved Code of Practice. HSE Books. ISBN 0-11-042919-2 (£4.50).

Code of Practice for the Management of Agricultural and Horticultural Waste. Available from the Plant Health and Seeds Inspectorate.

The Producer Responsibility Obligations (Packaging Waste) Regulations amended 2002. Available from DEFRA Publications.

Environmental Best Practice in the Production of Ornamentals. A Guide for UK Growers. Available from ADAS Horticulture.

Irrigation Best Practice. A Guide for Container-Grown Ornamentals. Available from ADAS Horticulture.

The Safe Sludge Matrix, ADAS 2001. www.adas.co.uk/matrix

5.0 APPENDIX 1 PESTICIDE STORES / MIXING AREAS.

Every pesticide store should be large enough to hold the maximum capacity of pesticides likely to be kept in the store at any one time. The store may consist of a safe in a production area or a room (or safe) in a purpose built store.

The store must be:

- Safely sited to minimise the likelihood of fire and reduce the danger it would present, and to avoid pollution of ground or surface waters.
- Of adequate capacity and construction.
- Capable of retaining spillage of the maximum amount held plus 10%.
- Properly lit, ventilated and frost free.
- Resistant against fire.
- Designed so that containers can be safely stacked and moved in and out.
- Clearly and correctly marked.
- Secure and kept locked when not in use and accessible only to staff with the appropriate pesticide training.
- Physically separated from non-pesticide materials.
- Supplied with emergency facilities to deal with operator contamination (i.e. eye wash, a tap with clean running water no more than 10 m away, first aid kit, clear accident procedures with emergency numbers or basic first aid clearly signed).
- Equipped with a container of absorbent, inert material for absorbing any spillage as well as other tools for dealing with the spillage.

The store should also have shelving made of a non-absorbent material.

Good standards of housekeeping and checking of the store contents at regular intervals helps to prevent problems such as leaking containers and the inadvertent storage of pesticides that are no longer approved.

The pesticide mixing area (if away from the pesticide store) must be equipped with a water supply and appropriate utensils for mixing and dealing with any spillage. The area and utensils should be cleaned regularly to avoid potential contamination.

6.0 APPENDIX 2 SUB CONTRACTOR MINI AUDIT FORM.

BUSINESS NAME

BUSINESS ADDRESS

NAME OF CONTACT

NAME OF INSPECTOR

DATE OF INSPECTION

SUMMARY OF INSPECTION AND ACTION POINTS

			Score	Comments
1.0 STRATEGIC				
1.1 HEALTH AND SAFETY				
1.1.1 FEPA requirements	Staff certification list	MAJ		
	Advice (BASIS reg).	MAJ		
	Pesticide storage / use	MAJ		
1.1.2 COSHH assessment	Assessment	MAJ		
1.1.3 Health and safety policy	Policy	MAJ		
and assessment	Assessment	MAJ		
1.2 ENVIRONMENTAL				
POLICIES				
1.2.2 Peat and its alternatives	Peat source			
1.2.5 Pollution safeguards	Fuel storage	MAJ		
	Fertiliser / acid storage	MAJ		
1.2.6 Environmental pollution	Check			

			Score	Comments
1.2.7 Recycling	Check	MAJ		
1.2.8 Waste disposal	Green waste			
	General waste	MAJ		
1.5.2 Employment documentation	Check	MAJ		
2.0 PRODUCTION				
2.1 CULTURAL CONSIDER- -ATIONS AND HYGIENE				
2.1.1 Site selection and preparation	Site assessment	MAJ		
	Weed control	MAJ		
2.1.2 Nursery site	Weeds	MAJ		
2.1.3 Production areas	Crop debris	MAJ		
	Unmarketable product	MAJ		
2.1.4 Delivered product	Trolley check			

			Score	Comments
2.1.5 Production materials	Growing media	MAJ		
	Containers	MAJ		
	Water tanks	MAJ		
2.1.6 Vermin	Trap check			
2.1.8 Staff arrangements	Hygiene standards			
2.1.9 Material storage on site	Check			
2.2 CLEANING				
2.2.1 Between batches	Check			
2.2.2 End of season / end of crop	Check			
2.2.3 Broken glass	Check policy			
2.3 PEST AND DISEASE AND WEED CONTROL				
2.3.2 Monitoring	Check records			

			Score	Comments
2.4 NUTRITION				
2.4.1 Growing media	Recipe or spec. check			
2.4.2 Fertiliser use	Analysis records			
2.5 ROUTINE CHECKING, CALIBRATION AND RECORDING				
2.5.4 Crop sprayers	Calibration records	MAJ		
2.5.6 Cold storage facilities	Check records			
2.5.7 Traceability of inputs	Check records			
2.6 PRODUCT QUALITY				
2.6.2 Establishment and product uniformity	Check product			

			Score	Comments
2.7 LABELLING	Batch	MAJ		
	Consumer			
3.0 CUSTOMER				
3.1 PRODUCTION PLANNING AND CONTROL	Check records			
3.2 TRANSPORT				
3.2.3 Delivery records	Check records			
3.6 TRADING CONDITIONS				
3.6.1 Insurance	Check records	MAJ		