

Introduction

1. EU policy on seeds provides for a system of control designed to allow the free movement of seed between Member States whilst ensuring that prescribed minimum quality levels must be met before seed can be legally marketed. The technical control work and quality assessment of the final product is made the direct responsibility of each Member State. Tests and examinations are required to be carried out officially and the Government of each Member State is directly responsible for the results. So far as seed testing is concerned the Official Stations are responsible under their respective Certifying Authority for ensuring that the necessary tests are carried out either in their own premises or under their supervision in authorised premises, known as Licensed Stations. Such stations are authorised by the appropriate Certifying Authority (In the case of England APHA also acts for the Welsh Assembly Government) to undertake tests required for the purposes of the Seed Marketing Regulations which implement EU Directives; the results of these tests have the same legal status as those obtained from tests carried out in the Official Stations in the United Kingdom and in the EU. The Certifying Authority (APHA), acting through the Official Stations, sets the standards of analysis, quantity and kind of equipment, accommodation and other relevant matters. Licensed Stations are required to use the same types of equipment, or approved equivalents, and analytical procedures approved by the Official Stations, to maintain prescribed records of tests and germination conditions, and to provide approved storage facilities, laboratory accommodation and staffing ratios. The Analyst-in-Charge of a Licensed Station shall be in effective control of all statutory seed testing carried out at the station.
2. Licensed Stations are subject to inspection visits and are also required to retain for a prescribed period reference samples (known as reserve portions) of all official tests which have been carried out. These can be called in for check testing at the Official Station **at any time**. The level of supervision – both direct and indirect – must be such as to leave no doubt at all that the standard of testing at all Licensed Stations is uniform with that of the Official Stations.

Authority

3. Stations are licensed under the Plant Varieties and Seeds Act 1964, and the Seed Marketing Regulations. The licence names each species and category of seed which the station is authorised to test. The licence is granted on a continuing basis, subject to satisfactory performance and to payment of an annual licence fee. There will be no minimum qualifying number of tests, as expertise will be judged on performance. Anticipated changes in staff, accommodation, volume of work or equipment must be submitted for approval as soon as known.
4. For the purposes of seed regulations Licensed Stations are authorised to test species of seed, specified in their licence, of all categories. All tests for International Certificates, whatever the category of seed, must be carried out at an Official Station.
5. If any station is found repeatedly to be unreliable in its testing of a particular species of seed, that species may be deleted from its licence. The licence may be revoked or suspended for all species in any circumstances in which the Certifying Authority concerned, with the benefit of advice from the Official Station, considers it advisable to do so. Each case will be judged on its merits, which might be such that revocation for a period would be appropriate, to allow for the fault to be rectified, after which it would be necessary to make a fresh formal application for a licence. If the original problems have been resolved to the satisfaction of the Official Station they will recommend to the Certifying Authority that the licence should be reinstated. If the licence is reissued the Licensed Station will be supervised for a probationary period by technical staff from the Official Station.

Supervision

6. The term supervision will cover visits of Authorised Officers from the Official Station plus the work entailed at the Official Stations in assessing results of tests and advising Licensed Stations of the reasons for discrepancies between their figures and check tests, and of the action to be taken to correct any fault. Visits to stations will include a formal audit of procedures and records and re-assessment of analyst's competence and may include collection of reserve portions. Analysts in Licensed Stations will be able to send samples to the Official Stations for advisory testing however a charge will be made for this service.

Fees

7. Annual licence fees are designed to recover the full cost of supervision of Licensed Stations. The Certifying Authority sends an invoice to the Licensed Station at the appropriate time, requesting payment. In addition certain charges apply for training courses and examinations.

Records

8. Records of tests made by Licensed Stations must be kept in a standardised form.

Training and qualifications of analysts

9. Seed analysts are trained by the Official Station, under the approval of the Secretary of State, and full details of courses are available from the Chief Officer. There is a specific additional training course dealing with seed laboratory management normally taken at least a year after passing a seed analysis course which must be passed in order to qualify for the management of a Licensed Station. Refresher courses in seed analysis are available as part of the chargeable service.

Testing for other Licensed Stations and for firms without stations

10. A Licensed Station belonging to a Licensed seed person marketing shall only carry out statutory seed testing on seed lots produced by or on behalf of that person unless otherwise agreed between the Licensed person, the applicant for certification and the Secretary of State. Applications for an establishment to be licensed will be accepted from any person or company in a position to satisfy the appropriate Certifying Authority that the qualifying and other conditions will be fulfilled.

Laboratory standards for Licensed Stations

11. The following standards are published as a guide to laboratory requirements but each laboratory will be subject to inspection by an officer of an Official Station before it can be considered for registration as a Licensed Station, irrespective of whether the station has been previously licensed, and/or inspected. The species of seed on which statutory tests may be undertaken will be specified on the licence schedule. The person in charge of a Licensed Station may apply to the Secretary of State for the licence held to be varied to add another species of seed to the licence and the Secretary of State may vary the conditions imposed by the licence.

Accommodation

12. The laboratory shall be adequate in size for the number of analysts, including assistants, employed at peak periods and for the number of tests carried out. It must have good natural light for purity tests, have adequate power and water services, be maintained in a good state of repair, decoration and cleanliness and be free of rodents and other pests. The laboratory shall normally only be used for seed testing purposes. It must not be used for chemical analysis or for any purposes which involve the extensive use of chemicals, or for any other purpose which might affect the proper testing of seeds. Provided that sufficient accommodation and staff are available, the laboratory could be used for such tests as tetrazolium, vitascope and conductivity, and also for certain disease and variety tests. The kinds and extent of such testing proposed must be stated when applying for registration. If a laboratory which is already registered wishes to undertake additional work of this kind, authority must first be obtained from the Certifying Authority. Purity and germination testing, including ancillary work for either, should be carried out in different parts of the laboratory or, ideally, in different rooms, and sufficient storage space for material and equipment must be provided.

Staffing

13. The laboratory must be in the charge of a practising analyst, qualified to Laboratory Management level in the testing of seed handled by the laboratory. An Analyst-in-Charge shall be in effective control of seed testing, will normally be present when statutory testing is in progress and must at all times maintain close supervision of the work of the laboratory. The number of staff required will depend on the total number of tests carried out, the ratio of qualified to unqualified supporting staff, the species of seed tested and the amount of associated clerical and administrative work undertaken by the analytical staff. The staff/work ratio must be not less than that applied in the Official Stations, after adjustment for special circumstances.

Statutory tests must be undertaken by staff qualified as seed analysts in the appropriate crops. In order to maintain eligibility to carry out statutory tests, qualified analysts are required to undertake reassessment at regular intervals during the annual audit visit conducted by Official Station staff. Where eligibility has lapsed it will be necessary to attend an appropriate revision course before statutory testing work is resumed.

Purity tests

14. Purity test methods must be the same in all respects as those employed by the Official Station. If a sample fails to reach standard, the test must be completed and reported, never aborted.

14.1 Working surfaces

The working surface for the purity test should be level and sufficiently large for comfortable working with the maximum size of sample examined. Bench surfaces should be smooth, easily cleaned, neutral coloured and as far as possible of non-reflecting (matt) materials. (Plastic laminates are usually the most suitable surfaces.) They should be kept clean, tidy and free from extraneous objects.

14.2 Light

Where artificial light is used to supplement daylight it should be of a type suitable for colour matching and comparison. Advice on suitable lamps can be obtained from the Official Station. Where it is proposed to use some other light source evidence of its suitability must be provided.

14.3 Sampling equipment

Sample division should be carried out using a mechanical divider of approved design and manufacture, e.g. the Pascall centrifugal divider, or an approved riffle type. The divider should be used on a level, secure and vibration-free bench. Some form of dust extraction system is desirable where dirty or powder treated samples are being handled. The hand method of sampling by constant mixing and halving is not acceptable.

14.4 Balances

Balances must be capable of weighing to the level of accuracy specified by the Official Station for the species of seed being tested. They should be positioned on level, vibration-free surfaces away from draughts and direct sunlight. The more sensitive balances should be placed on shock-proof tables separate from other items of equipment. Balances should be serviced at least once a year by the supplier or a specialist agency (unless of maintenance-free design). A record should be kept of servicing. Unless a new balance has been obtained or there is a satisfactory record of servicing for an existing balance, it will be necessary to obtain a written report from the manufacturer or his approved agent that the equipment in question meets the manufacturers' specifications. Regular checks should be made by laboratory staff of the zero and range.

14.5 Miscellaneous items of equipment

Analysts should be provided with the necessary small tools for their work. These include seed spatulas, scalpels, large and small forceps, hand or tripod lenses (X10), patty pans, watchglasses etc. In laboratories testing seed of grasses a diaphanoscope is essential, it is also useful for the assessment of empty oats. For seed where the uniform blowing method is specified by the Official Station, a blower of approved manufacture and design must be used. This must be positioned on a secure, vibration-free, level surface away from draughts and direct sunlight and also be correctly calibrated. Calibration must be carried out, using the appropriate calibration sample supplied by the Official Station, before each batch of samples is tested, or at least every five working days when the blower is in regular use. A record of calibration dates must be kept.

Germination tests

15. Germination test methods must be the same in all respects as those approved by the Official Station.

Statutory germination tests are based on 400 seeds, and **all** seeds and seedlings must be counted in all tests.

15.1 Media

Paper, sand and organic growing media must be the same as those approved by the Official Station.

15.2 Temperature control

The equipment, whether for the germination test itself or for pre-chilling or pre-drying must be capable of maintaining required temperature to within $\pm 2^{\circ}\text{C}$ at the level of the seed. This accuracy of temperature control must be achieved even under variable ambient conditions, including the least favourable conditions likely to occur. Where tests are carried out without control of ambient temperature, compensation for ambient temperature changes influencing the substrate temperature must be achieved by automatic adjustment of the equipment controls or room temperature. When alternating temperatures are required the changeover period from the high temperature to the low temperature must be no longer than 1 hour in duration. Temperatures must be maintained at the prescribed levels for the prescribed period. Automatic changeover and temperature control is essential in order to maintain control when the laboratory is unmanned.

15.3 Light

Where light is prescribed it may be provided entirely artificially or be natural light supplemented with artificial light. The intensity of the light should not be less than 750 lux at the level of the seed at any time during the period of illumination. Artificial light should be provided either by the kind of fluorescent tubes recommended by the Official Station or by some other light source which can be shown to provide a light spectrum which promotes germination in light sensitive seeds and causes proper seedling development.

Where seeds are germinated at alternating temperatures light should be given during the high temperature phase and during cooling until the lower temperature is attained. Automatic control of light periods is recommended at all times and is essential except where a qualified analyst is employed full-time in the laboratory.

15.4 Humidity control

Wherever prescriptions specify methods of preventing rapid drying out of the substrate these must be followed. Unless evaporation from the substrate is prevented by a mechanical barrier, e.g. enclosing in polythene, it is necessary to maintain the relative humidity of the germinator at not less than 90%.

Miscellaneous items of equipment

16.1 Germination dishes and boxes

Where tests are carried out in sand, organic growing media or on paper in boxes, e.g. sugar beet, the containers for these tests should be of non-toxic material capable of being thoroughly washed or heat sterilised. The types of container to be used must be approved by the Official Station.

16.2 Sugar beet seed washer and drier

The washing apparatus should be constructed of non-toxic materials and capable of rinsing the seed in water at 25°C with a complete change of water every 10 minutes. The seed may be dried by blowing air at 25°C through it.

16.3 Sterilisation Equipment

It is necessary to carry out routine sterilisation of dishes, sugar beet boxes and incubator trays for 2 hours at 150°C. An oven of sufficient capacity and capable of maintaining the required temperatures is essential. Where it is intended to re-use sand, the sterilisation equipment should be capable of completely drying the sand and then heating it to a temperature of 150°C for two hours. After sterilisation the sand must be screened using a 0.8mm sieve and a 0.05mm sieve. Sand which has not been sterilised and graded must not be re-used. Sand used for germination tests on chemically treated seed should not be re-used.

16.4 High standards of cleanliness and maintenance of equipment are essential. Recommended procedures for cleaning and sterilisation must be followed and records kept of these operations. Refrigerators must not be used for the storage of food or drink, or any other materials whatsoever.

Checks on equipment

17.1 Routine temperature recording must be carried out and records kept for inspection as evidence that germination apparatus is working efficiently. Where high relative humidity is required in germination rooms and cabinets, records of relative humidity either by direct measurement or wet and dry bulb temperatures should be kept. Where an analyst is working full-time in the laboratory frequent temperature recordings (not less than three times a day) spread fairly evenly through the day should be made. Where a qualified analyst is not employed full-time automatic monitoring of temperature and humidity is necessary. All laboratories are subject to independent checks on the efficiency of temperature control.

17.2 The Official Station is able to recommend suitable equipment for germination tests and for recording temperature and humidity. Where it is proposed to use other kinds of equipment it will be necessary to produce evidence that it is at least equivalent in performance to that which is already recommended for any particular situation.

Receipt of samples

18. Samples for statutory test must only be accepted by the laboratory if they are at least the minimum prescribed weight and in a correctly sealed sample bag which bears an appropriate CERT 5 label.

Storage of samples

19. All samples on which statutory tests are made must be stored, sealed and with CERT 5 labels attached, for the prescribed period and be readily available for collection if required for checking by the Official Station. The seed must be stored in permeable containers under dry, cool conditions away from radiators, sinks, water pipes and surfaces on which condensation might form. It must also be protected against rodents and other pests. Chemicals must not be kept in the seed store.

The prescribed percentage of Licensed Station Reserve Portion (LSRP) samples for check testing shall be sent to the Official Station. This shall be done weekly or once the seed samples are ready whichever is the sooner.

Records

20. All records must be in the form prescribed by the Certifying Authority and the Official Station and be kept up to date and available for inspection at any time.

Analysts are reminded that the CERT 10 is regarded as the essential legal document for reporting statutory test results.

Health and Safety

21. Licensed Stations must adhere to Health and Safety requirements, consulting with the Health and Safety Executive as necessary.