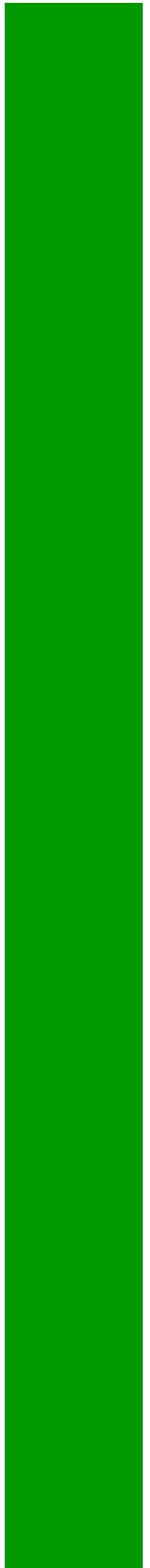


**Department of Agriculture**

**Farm Management Handbook**

**Agronomy Section**

**(Colour code: Green)**



# AGRONOMY TESTS

In the Department of Agriculture's laboratory the following services are available to farmers:

1. **Seed germination test** (to measure % viable seed count).
2. **Feed Test** of feed samples (e.g. feed hay, silage or brassica crops). This will include % dry matter, crude protein, crude fibre and minerals present.
3. **Soil analysis** Includes pH test, plant available nutrients (nitrogen, phosphorus and potassium, plus some trace elements).
4. **Estimation of field crop yields** This is done by sampling (using quadrat) and subsequent dry matter analysis to give the dry matter yield/ha.
5. **Tissue Test** This is defined as the diagnosis of mineral disorders in plants/crops by visual and chemical means. Advice can then be provided for countering or preventing such disorders.

There are five stages in the crop analysis programme.

1. **Visual diagnosis** – various trace/major plant nutrient deficiencies often demonstrate changes in plant colouring, morphology and anatomy.

In many crops the visual appearance of a particular symptom at a particular stage of growth is uniquely characteristic of a specific nutrient deficiency.

2. **Sample collection** – obtaining a sample of a crop which is representative of the crop being tested is very important, especially if reliable assessments of the plant nutrient status are to be made.

The elemental content of plant tissue can vary from month to month, so plants are usually always sampled from clearly defined locations on the plant. These are normally mature leaves (exposed to full sunlight), just below the growing tip on main branches/stems.

Plant tissue which has been damaged by insects/machinery or diseased/dead should not be sampled. Likewise tissue covered in soil should not be collected.

Random samples need to be collected from various locations throughout the complete crop area. Separate samples should also be collected from 'good' and 'bad' areas for comparison purposes.

Collected samples should be put in paper bags and kept in a cool place before despatch to the laboratory for testing. It is not advisable to put plant samples in sealed airtight plastic bags.

3. **Analytical testing** – samples are catalogued on arrival before mixing and sub-sampling. Dry matter analysis is carried out first then the sample is ground up finely in a laboratory mill. The various chemical tests can be carried out on the dried, ground sample.
4. **Recommendations** to be conducted by the DoA Agricultural Advisor (Agronomy) and Agricultural Assistant (Agronomy).

## COMMON FORMS OF FERTILISERS AND THEIR NUTRIENT CONTENT

Fertiliser	N%	P%	K%	S%	Ca%	Na%
<b>• Nitrogen (N)</b>						
Ammonium nitrate (Nitram)	34.5					
20:10:10	20	4.4	8.2			
Urea	46					
Ammonium sulphate	21			24		
Calcium nitrate	15.5				20	
Ammonium nitrate sulphate	26			12		
Calcium cyanamide	21				38	
Sodium Nitrate (Nitrate of Soda)	16					26
Calcium ammonium nitrate (CAN)	21-27					
<b>• Phosphorus (P)</b>						
Single superphosphate (SSP)		9		11	18-20	
Super Fosfato(SSP Chilean)		21/21		25		
Triple Superphosphate (TSP)		20			24	
Super Fosfato Triple (TSP Chilean)		46/46				
Sulphur coated TSP		16		20	11.8	
Monoammonium Phosphate (MAP)	10-12	22		1-3		
Fosfato Monoamónico(MAP Chilean)	12	52/52				
Sulphur coated MAP	9	19		12	1.7	
Diammonium Phosphate (DAP)	18	20		1-3		
Fosfato De Amonio (DAP Chilean)	18	46/46				
Sulphur coated DAP	16	18		12	0.6	
Basic Slag		2-9				
Rock Phosphate (Gafsa)		11-17				
Fosforita Natural	0	10-29				
Rock Phosphate (Chilean)		8	0.5	0.7	24	
<b>• Potassium (K)</b>						
Muriate of Potash (Potassium chloride)			50			
Choruro De Potasio			60			
Sulphate of Potash (Potassium sulphate)			42	17		
Potash nitrate (Potassium nitrate)	15		37			
Dicalcium phosphate		17			22	
Chilean potash nitrate	15	0	12			9-18
<b>• Sulphur</b>						
Powdered sulphur				100		
Gypsum				10-18		

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<b>• Calcium</b>						
Lime					35-40	
Dolomite					16-21	
Calcifert						
<b>• Organic</b>						
Sheep dung	1.5	0.15	0.82		0.3	
Cow dung	0.6	0.1	0.6			
Dried Blood	12					
Hoof and Horn Meal	14					
Meat and Bone Meal	6	5				
Fish Meal	6	2				
Bone Meal	4	9				
Shoddy (Wool Waste)	12					

# Soil Testing and Site Selection Guidelines for Cropping/Pasture works utilising the Farm Improvement Programme (FIP) funding

## Purpose:

To improve the establishment, yields and subsequent utilisation of forage crops and pastures via improved site selection and soil testing.

## Recommendations

That all future first year FIP crops/pasture sites be scrutinised according to the criteria outlined in existing FIP planning plus those contained in this paper. Which are as follows:-

- Farmer to initially identify potential sites based on DoA site selection guidelines (see attachment 1). Each sample must be accompanied with soil test application sheet (attachment 2).
- A soil sample for each potential site is to be collected with the sample made up of at least 20 sub-samples, collected according to DoA soil sampling guidelines (see attachment 3).
- Number of potential sites should be restricted to a maximum of 3 per proposed FIP site (in the first instance).
- Soil test to be carried out by the DoA for all elements.
- There will not be any charge for testing these preliminary soil samples.
- Based on preliminary soil sample test results, those sites with a pH greater than 4.6 will be further investigated for suitability.
- DoA to visit farm and look at selected sites matching site selected to guidelines.
- Soil test to be reviewed and if acceptable the sites will be approved. The crop/pasture must be approved as per normal via annual FIP plans.

The site selection and soil testing should not be viewed solely on the basis of the initial crop. It should also take into account the long term sustainability and productivity of the final pasture.

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## DoA Site Selection Guidelines

Listed below are guidelines that should enable farmers to identify “lower risk” sites.

**Soil Depth** – Ideally one spade blade depth (12 inches) on top of clay. Shallow soils although often slightly more fertile, reduce the ability for roots to develop properly. Shallow soils also reduce the soils moisture holding capacity. Such a crop is more likely to suffer from drought problems in a dry summer, reducing yield and quality of the forage. Deep peat soils generally tend to be more acidic and therefore less fertile. Also a loss of up to 2 inches of soil due to erosion needs to be accommodated for with rotavating.

**Stock Water availability** – Animals need to drink as well as eat.

**Shelter (Animals)** – Animals on small areas of crops, still need shelter, shelter could come in various forms. Including valleys, leaving areas of vegetation (cinnamon grass, fachine etc), as these plants may also be able to supply trace elements to the animals.

**Shelter (Plants)** – In 2006/07 many crops showed the advantage of protection from the prevailing westerly wind. Soil and seedlings are particularly vulnerable in sites open to westerly winds. These sites are also more prone to drying out reducing potential yields and plant quality.



# AGRICULTURAL REQUEST FORM

Please return all completed forms along with samples to the  
Laboratory at the Department of Agriculture

Submitter \_\_\_\_\_ Date \_\_\_\_\_

Property \_\_\_\_\_ Phone No. \_\_\_\_\_

Email \_\_\_\_\_

Address \_\_\_\_\_

Paddock Name: \_\_\_\_\_ Paddock Size \_\_\_\_\_

Previously Sown As: \_\_\_\_\_

For feed test, please circle what crop it is to be used for:      HAY    SILAGE      GRAZED

To Be Sown As: \_\_\_\_\_

Fertiliser History: \_\_\_\_\_

Copy of Map attached       GPS Co-ordinates \_\_\_\_\_

SOIL TESTS	FEED TESTS	PLANT TESTS
pH <input type="checkbox"/>	Nitrogen <input type="checkbox"/>	% Germination <input type="checkbox"/>
Nitrate nitrogen <input type="checkbox"/>	Dry matter <input type="checkbox"/>	Minerals:
Ammonium nitrogen <input type="checkbox"/>	Fibre <input type="checkbox"/>	Ca <input type="checkbox"/> P <input type="checkbox"/>
P <input type="checkbox"/>	Ash <input type="checkbox"/>	M <input type="checkbox"/> Mn <input type="checkbox"/>
K <input type="checkbox"/>	Crude Protein <input type="checkbox"/>	K <input type="checkbox"/> Fe <input type="checkbox"/>
Bulk density <input type="checkbox"/>	N.D.F <input type="checkbox"/>	Cu <input type="checkbox"/> Na <input type="checkbox"/>
S <input type="checkbox"/>	Minerals:	S <input type="checkbox"/> Cd <input type="checkbox"/>
Mg <input type="checkbox"/>	Ca <input type="checkbox"/> P <input type="checkbox"/>	Other [state] <input type="checkbox"/>
Ca <input type="checkbox"/>	M <input type="checkbox"/> Mn <input type="checkbox"/>	
Al <input type="checkbox"/> Fe <input type="checkbox"/>	K <input type="checkbox"/> Fe <input type="checkbox"/>	
Cu <input type="checkbox"/> Mn <input type="checkbox"/>	Cu <input type="checkbox"/> Na <input type="checkbox"/>	
Cl <input type="checkbox"/>	S <input type="checkbox"/> Cd <input type="checkbox"/>	
Conductivity <input type="checkbox"/>	Other [state] <input type="checkbox"/>	
Soluble Salts <input type="checkbox"/>		

Has this paddock been tested by the DoA before?      Yes                       No

Submitters Signature \_\_\_\_\_

*DoA use only*

Receiver Signature \_\_\_\_\_ Total Cost \_\_\_\_\_ Invoiced \_\_\_\_\_

## STEPS FOR COLLECTING AND STORING PLANT SAMPLES

You will need:

- Clean plastic bags.
- Permanent marker to write on plastic bags.
- Square measure [for crops still in fields] – this can be obtained from the DoA or you can measure out a metre square using a tape measure and some pegs.
- Clean scissors or hand shears if taking pasture or oat samples.
- Map or GPS with co-ordinates showing where samples were taken.

Collecting the sample:

### Brassicas

Stand in a random spot of the paddock and throw out the square metre – or measure out your square metre. Where it lands remove any plants within its perimeter. Remove any excess soil and place into plastic bags with the date, paddock name and farm name written on. Submit straight to the DoA or store in the fridge.



### Oats / Pasture

Walk through the paddock at random and cut a sample to ground level with clean scissors or hand shears every 10 steps from near the toe of your right boot. Avoid including any soil or dung in the sample. Try to keep the size of each sample about the same size, take at least 15 samples from random areas in your paddock, and make sure the samples are representative of the paddock. Put the samples into a clean plastic bag [preferably zip-lock] with the farm name, paddock name and date written on it and submit straight to the DoA or store in the fridge.



### Silage bales / Hay – please note; samples must be taken from the same 'lot'

Take a handful from at least six bales, avoiding the outside edges. Mix thoroughly and place into a clean plastic bag [preferably zip-lock] with farm name, paddock name, and date written on it. Silage will need to be stored in the fridge if not submitted straight to the DoA, hay doesn't.





# Farm Note

Department of Agriculture  
Falkland Islands  
Prepared - February 2001, Revised -

**No. 100**

## **GROWING MONTEREY CYPRESS (*Cupressus macrocarpa*) FROM SEED**

Monterey Cypress (*Cupressus macrocarpa*) is a fast growing tree well adapted to dry, well drained soils in the Falkland Islands. It is easy and cheap to grow from seed. This Farm Note describes how to grow Monterey cypress from seed.

### **Preparing**

- 1) Seed cones can be collected at any time of the year, providing they are not green. Mature deep brown cones that are beginning to open are the best.
- 2) To open cones place them in a plastic bag in an airing cupboard. Alternatively, place them in the bottom of the stove in a bowl for a few days.
- 3) Collected seeds should be placed in tepid water for about 24 hours. All seeds that are floating are not viable and should be discarded. Seeds that have sunk should then be left to dry out for a few hours.

### **Propagating**

- 4) The best time to sow macrocarpa indoors will be late winter (July/August).
- 5) Sow seeds in a tray (the size of an A4 sheet of paper is ideal – approximately 30cm \* 21cm) filled with potting compost or a suitable peat mixture of your own. This can be made from peat, peat ash and freshwater sand in the proportions 4:2:1. Do not use salty sand from the beach.
- 6) Spread the seeds at about 5mm apart from each other over the surface of the tray. This spacing should prevent their roots tangling which will assist the pricking out stage.
- 7) Place some good compost in a fine sieve and shake this over the top of the tray until the seeds are covered by about 3mm of the compost.
- 8) Place the tray on the floor and at a height apply some water with a fine rose on the end of the watering can. The height helps the water to spread out more minimizing the disturbance to the fine surface of the tray.
- 9) Place the tray into a plastic carrier bag and place it in either a refrigerator 4°C or a freezer <0°C for about 3 - 6 weeks. This will then break dormancy of the seed (normally it take be 5-6 months).
- 10) After this period remove the plastic bag and replace with a clear bag (e.g. freezer bags) then place into a room at 18 - 24 °C. Place the tray out of direct sunlight and shade it with a sheet of newspaper. Forcing is the technical term giving to increase plant growth, by controlling the environment.
- 11) There is no need to water the tray, as the freezer bag will conserve the moisture that would have evaporated.

### **Pricking Out & Hardening Off**

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12) When seedlings do emerge they will have 3 seed leaves called cotyledons. When the next set of true leaves appear the seedlings will be about 5cm tall and by this time there should be quite a few seedlings in the tray.

13) Place the tray into a cold-frame or unheated poly-tunnel and leave for 3-6 weeks until fully hardy. Water occasionally but do not to let the tray dry out.

14) Using a blunt knife or similar instrument carefully loosen the soil whilst holding the seedlings by the cotyledons. Damage to the roots could affect on future growth of the tree.

15) Prick out the seedlings and transplant them into either pots or a small nursery which ever is desired.

16) Leave the trees in the nursery or in their pots to over winter. The optimum size for digging up the following winter is between 6-12 inches. Then be careful not to disturb the root system, as macrocarpa roots are very sensitive to disturbance. Make sure most of the soil stays on the roots when planting. During summer periods always keep the soil moist and weeds to a minimum. Macrocarpa does not like competition in the first few years.

Remember: PLANNING PREPARATION PERSISTENCE AND PATIENCE are the key factors to successfully growing trees.