PEANUT PRODUCTION GUIDE

Website: www.pca.com.au





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SUMMARY

Varieties:

Virginia Types:

Middleton, Wheeler, Fisher

Runner Types:

Menzies, Holt, Page

Ultra Early Type:
Redvale

Sowing Time: Qld - September to December (depending upon district). Crop matures in about 18 to 24 weeks depending on variety and season temperatures.

Soil Type: Well-drained, friable soils. Sandy loam, silty loams, friable clay loam.

Land Preparation: Deep, well prepared seedbed on preferably 75, 90 or 100 cm row spacings. High rainfall areas may plant on hills / beds.

Planting Equipment: Recommended planting equipment includes the following:

John Deere Max-Emerge vacuum precision planter. Mason Deere type planter with rotary cones. Nodet and Gaspardo pneumatic planters can be used with modifications. Covington box or some inclined plate planters, or flat plate planters such as the International 186 and 184 series. Monosem vacuum precision planter.

Sowing Rate:

Virginia Types

Dryland	Plant to achieve 60,000 to 80,000 plants / ha for Virginia types.
Irrigated	Plant to achieve 115,000 to 125,000 plants / ha for Virginia types.

Runner Types

Dryland	Plant to achieve 60,000 to 80,000 plants / ha for Runner types.
Irrigated	Plant to achieve 130,000 to 140,000 plants / ha for Runner types.

Ultra Early Types

Dryland	Plant to achieve 120,000 to 130,000 plants / ha.
Irrigated	Plant to achieve 180,000 to 200,000 plants / ha.

Inoculation:

Peanuts are a legume so the seed needs to be inoculated with a Group P inoculant to ensure effective nodulation. Failure of the plants to nodulate will cause reduction in nitrogen fixing ability and lower yields.

Appropriate inoculant is available from PCA.

Weed Control:

Depends on weed spectrum. Some options are:

Pre-planting:	Trifluralin	@ 1.4 - 2.8 L / ha incorporated
Pre-emergence:	Dual Gold®	@ 1.0 - 2.0 L / ha
Post-emergence:	Blazer®	@ 1.0 - 2.0 L / ha
	Buttress (2, 4-DB)	@ 1.3 – 1.7 L / ha
	Basagran®	@ 1.2 - 2.0 L / ha
	Gramoxone®	@ 0.5 - 1.0 L / ha
	Flame ®	@ 0.2 – 0.4 L / ha
	Spinnaker ®	@ 100 – 140 grams / ha

Fertilisers:

Soil Test will give best indication but some common ranges are shown here.

Phosphorus	100 - 300 kg / ha Triphos
Nitrogen	Not required unless levels below 5 ppm
Potassium	Up to 200 kg / ha of Muriate of Potash
Calcium	Generally 0.5 tonne to 1 tonne / ha of Natural Gypsum at flowering
Boron	Up to 5kg / ha Solubor Foliar Spray
Trace Elements as foliar sprays	May need up to 4kg / ha of Zinc Sulphate (Heptahydrate), Copper Sulphate, Magnesium Sulphate, Manganese Sulphate. May need 200 – 400 grams / ha Sodium Molybdate

Irrigation:

Crop uses between two and six ML / ha depending on rainfall and soil type.

Consult agronomist to determine appropriate irrigation schedule. If water is limited, strategic or supplementary irrigation is recommended.

Peanuts can be watered with sprinklers (e.g. Centre Pivots), travellers or flood irrigation (depending upon soil type).

Trickle (tape) irrigation can also be used in some circumstances.

Insects:	Heliothis	Methomyl Vivus/Max	@ 1.5 - 2.0 L / ha @ 150 ml / ha
	Jassids	Dimethoate	@ 340 - 350 mls / ha
Diseases:	Rust & Leafspot	Bravo 720®	@ 1.1 - 1.8 L / ha
		Folicur®	@ 0.2 - 0.44 L / ha
		Amistar Xtra®	@ 0.5 - 0.75 L / ha
	Sclerotinia	Rovral®	@ 1.0 L / ha

Harvesting: A peanut digger is used to dig the bushes and invert them so the peanuts are exposed to the air and not lying in the dirt. The crop is threshed 3 – 7 days later and the peanuts are pre-cleaned prior to delivery to PCA Kingaroy or Tolga depots for drying and receival.

Yields:	Dryland Sth Qld	Range 1.5 to 4.0 tonnes / ha (Average 2.5 tonnes / ha)
	Dryland Nth Qld (High Rainfall)	Range 2.5 – 6.0 tonnes / ha (Average 4.0 tonnes / ha)
	Irrigated	Range 4.0 to 8.0 tonnes / ha (Average 5.0 tonnes / ha)

Payment:

By Contractual Arrangement with PCA:

Contract arrangements include price, payment date and hectares planted.

All payments are calculated on the basis of kernel outturn percentage from delivery. The main components of a load are:

Snack Food Kernel	High value	(Jumbo, Grade1, Grade 2)
Manufacturing Kernel	Medium value	(Splits, Manufacturing)
Oil Kernel	Low value	(Through-sieve and hand-picked)
Shell	No value	

IN A NUTSHELL

THE 20 MOST ASKED QUESTIONS ABOUT GROWING PEANUTS

1. How Do Peanuts Grow?

Peanuts are not really a true nut and unlike many true nuts they do not grow on trees. They belong to the legume family and grow on a small bush or 'vine'. The crop takes 4 - 6 months to grow, depending upon variety planted.

2. Do The Peanuts Grow On The Roots Of The Plant?

No. Peanuts produce small yellow flowers in the axils of the leaves. These flowers are self-pollinated at night. The ovary then elongates and grows down to the soil. Once the ovary has entered the soil it starts to swell and form a pod.

3. What Soils Can I Grow Peanuts On?

The preferred soil types for growing peanuts are sands, sandy loams and light clay loams. Peanuts will grow on heavier soils, but harvest losses tend to be high in heavy or sticky soils.

4. Are Organochlorine Residues Or Heavy Metals A Problem For Growing Peanuts?

Organochlorine residues in the soil and heavy metals can be a major problem for growing peanuts. The peanut fruit or pod grows directly in the soil and takes up many of its own nutrients through the pod wall. Consequently pesticide residues and heavy metals are often taken directly into the peanut as it grows. This may then render the peanut unfit for human consumption*.

**** Peanut Company of Australia requires all new paddocks to be tested for pesticide residues prior to planting peanuts.***

5. When can I plant peanuts?

Planting generally takes place from September to early January. In some areas of Northern Australia peanuts are grown during the winter months. Peanuts are not very susceptible to daylength, but are more influenced by temperature. As a guide, peanuts need a minimum soil temperature of 18°C at planting depth, measured at 9 AM, in order to germinate.

One of the most important considerations for determining when to plant, is to determine the likely harvest time. Harvesting should preferably be conducted in a relatively dry time of the year.

6. Is There Money In Growing Peanuts?

Peanuts can be a field crop with relatively high returns, but returns are totally dependent on yields and quality. Best returns are obtained under reliable rainfall or irrigation with intensive management.

Gross margins vary from $300 to over $2000 per hectare for dryland crops; and from $900 to over $2000 per hectare for irrigated crops.

7. Are Peanuts Easy To Grow?

The most frequently quoted comment from experienced farmers is that peanuts are "not a difficult crop to grow, but can be a difficult crop to grow well."

PCA's agronomists as well as local private consultants assist growers to produce the best crop possible.

8. Do I Need Irrigation?

Best yields and quality (and therefore the best returns) are obtained either from areas with reliable rainfall, or with access to irrigation. Growing costs for peanuts are relatively high compared to other field crops, so growers must aim to maximise their returns. Irrigation or supplementary irrigation is becoming a necessity.

9. Can Peanuts Be Furrow Irrigated?

Most types of irrigation can be used for peanuts. Various sprinkler irrigation systems are most commonly used, but peanuts can also be irrigated with furrow irrigation providing the soil type is also suitable for peanut growing. Successful furrow irrigation requires good land levels and the peanuts sown on raised beds. Trickle irrigation of peanuts has had limited commercial success to date. (Please consult PCA Agronomists for further information on trickle irrigation.)

10. Do Peanuts Have Any Disease Problems?

Peanuts are susceptible to a number of foliar diseases, especially leafspot, rust and net blotch. Protective fungicides are available to keep most foliar diseases at bay.

Peanuts are also susceptible to several soil-borne diseases, especially sclerotinia, white mould and CBR (Cylindrocladium Black Rot). Good rotational practices, crop management and hygiene are the best defences against these diseases. Limited fungicides are available to combat peanut soil diseases.

11. Are Insects A Major Problem In Peanuts?

Various insect pests do attack peanuts, but compared to horticultural crops and cotton, insects are not considered a major problem. Regular scouting for insect pests is still warranted.
* Growers should budget on at least one spray for Heliothis caterpillars.

12. What Are The Future Market Prospects For Peanuts?

Australian grown production is not currently satisfying the domestic consumption of peanuts which is currently about 40 000 tonnes of farmers' stock peanuts annually. Export markets also exist in New Zealand and parts of Asia and Europe.

13. How Many Crops Of Peanuts Can I Keep Growing On The One Paddock?

To be successful peanuts must form part of a sustainable farming system. New ground that has never grown peanuts before may be able to produce two consecutive peanut crops. However the best system involves growing peanuts once every two or three years on the one paddock with a grass or cereal crop as the rotation species. Good rotation crops for peanuts include sugarcane, corn, rhodes grass and sorghum.

14. What Type Of Planter Do I Need For Peanuts?

Peanuts must be planted with a row crop planter. Combine planters are not suitable. The peanut seed is large and fragile. Plate planters like the Covington and Janke are commonly used, as well as rotary cone and finger pick-up planters like Mason Deere and KMC. Vacuum precision planters like John Deere and Monosem are gentle and well suited for peanuts. Nodet and Gaspardo vacuum planters must be modified to plant peanuts. Kinze planters with 'edible bean' cups are not suitable.

15. Do I Need Specialised Harvesting Equipment?

Peanuts do require specialised harvesting equipment. A digger / inverter is used to dig the peanuts from the soil. A combine or thresher is then used to separate the peanuts from the bush. Peanuts cannot be augered; belt elevators are used to move peanuts from storage bins to transport.

16. Do I Need To Own My Own Harvesting Equipment?

Peanut Company of Australia (PCA) can arrange for contract harvesting of crops in some areas, provided there is sufficient tonnage to justify the contractor's involvement.

Timing of harvesting operations is critical to guarantee high yields and optimum quality. Many peanut farmers purchase some of their own harvesting equipment within one to two seasons.

17. Do I Need To Artificially Dry Peanuts?

Growers are paid according to their peanut quality. Optimum threshing occurs at a pod moisture content of approximately 12 to 16%. Controlled drying then brings the peanuts slowly and gently down to a safe storage moisture content and ensures optimum quality. Paddock drying to 10% pod moisture content usually results in higher losses, more splits, poorer quality and increased risk of rain damage.

18. Who Buys My Peanuts From Me?

Peanut Company of Australia will purchase peanuts from growers. Growers can contract their peanuts to the company on a hectare basis with set grade prices and flexible payment options.

19. Where Can I Get Agronomic Advice From?

Peanut Company of Australia provides agronomic advice to growers and have a number of handouts and booklets available for growers. The Qld Dept. Agriculture and Fisheries also provides information on peanuts to farmers. In addition, many chemical and fertiliser resellers have trained agronomists who can provide assistance. Private Consultants are also available in most peanut growing districts.

20. What Determines How Much Money I Get Paid?

Growers are paid directly on the quality of their peanuts. A sample is taken from the load and tested for moisture content and the contaminant, aflatoxin. Further samples are collected and weighed. Extraneous material is determined in the sample which is then shelled and graded using a set of standard sieves. Payment is determined on the basis of this representative graded sample and the clean dry weight of the load. Deductions are made if aflatoxin is detected, depending on the level of infection. Kernel quality and the percentage of kernel content are the main determinants of final value of each load. The higher the quality/quantity of kernel in the load, the more the load is worth, i.e. peanut value is a quality-based system.

INTRODUCTION

Australia produces about 40,000 tonnes of farmer stock peanuts annually which represents only about 0.2% of the world's peanut production. More than 90% of Australia's peanuts are grown in the state of Queensland. The industry is based on the large-seeded Virginia varieties and medium seeded Runner varieties. Plantings are approximately $^{1}/_{3}$ Virginia varieties to $^{2}/_{3}$ Runner types. Some ultra early varieties with runner type kernel are also planted.

The size of the domestic market for peanuts is about 40,000 tonnes annually.

Australia is one of the few peanut producing countries where imports are freely permitted. The price that growers receive for their crop is therefore significantly influenced by world prices.

HISTORY OF THE INDUSTRY

Peanuts have been grown in Australia for over one hundred years. The first peanuts were grown in Queensland by Chinese gold-diggers in the Palmer River Gold Rush near Cooktown in the late 1870's.

In 1883 the Queensland Government proposed developing peanuts as a new industry for the state. Although some experiments were carried out, few peanuts were grown commercially until the early 1920's.

In 1922 the *Marrickville Margarine Company* (later known as *ETA Foods Ltd.)* purchased the entire Burnett peanut crop. This marked something of a turning point for the peanut industry in Queensland, demonstrating that there were viable commercial opportunities in the crop.

The peanut industry began officially in 1924 with the establishment of the *Peanut Marketing Board*. The Board was formed at the request of peanut growers to acquire the crop and market the peanuts on their behalf.

In 1927 an affiliated body, the *Queensland Peanut Growers' Co-operative Association* was established to assist with the efficient handling, storage and marketing of the crop. The Co-operative owned the majority of the assets of the organisation.

By 1930 production had increased to over 800 tonnes per year and the industry was becoming well established on the Atherton Tableland, west of Cairns. In 1933 the *Peanut Marketing Board* established a depot at Atherton.

Annual production reached 21,000 tonnes by 1960 and 47,000 tonnes by 1970. Production peaked in 1979 when over 61,000 tonnes were grown. Since then, both the area planted to peanuts and tonnage has fluctuated due to seasonal conditions and longer rotations especially with pastures and sugarcane.

In 1992 the *Peanut Marketing Board* was restructured from a statutory marketing authority to a public unlisted company, *PMB Australia Limited*. In 1995 the company's trading name was changed to *Peanut Company of Australia (PCA)* to better reflect the company's change from a marketing board structure and to highlight the company's core business.

TODAY'S PEANUT INDUSTRY

Today the Australian Peanut industry has about 160 growers, spread across various parts of the country. (**See Map – on Page 32)**

The area planted annually is about 15,000 hectares and this produces about 40,000 tonnes of farmers stock peanuts. Tonnages have varied in recent times from less than 15,000 tonnes to more than 50,000 tonnes. One third of production is from rain grown areas and two thirds from irrigated production. Rain grown crops average approximately 2.5t/ha yield in South Qld and 4t/ha in North Qld.

In contrast the irrigated areas regularly produce yields of five tonnes per hectare with some exceptional yields of over seven tonnes per hectare. There is a growing movement towards irrigated peanuts to ensure reliable supply for both our domestic and export customers.

THE PEANUT PLANT

Legume

The peanut or groundnut (*Arachis hypogaea*) is an annual legume crop which originates from South America. Like other legumes, peanuts are able to produce their own nitrogen, via a symbiotic relationship with a bacteria of the Rhizobia strain.

This beneficial bacteria infects the peanut root system and forms characteristic nodules, from which nitrogen is "fixed" from the atmosphere. This nitrogen is available to the plant for growth and development.

Growth Habit and Development

Depending on variety and conditions, the peanut plant can grow to a height of about 60 centimetres and can spread up to 100 centimetres. The plant is unique in that it flowers above ground and then once pollinated, produces its fruit below the soil surface.

The flowers, which are small, yellow and pea-shaped, are produced in the axils of the leaves. The flowers are self-pollinated, usually at night. After the ovary is fertilised it begins to elongate and grow towards the soil.

This 'peg' (as it is normally called), reaches the soil about seven to ten days after pollination. The ovary is carried in the tip of the peg and starts to grow into a pod after it pushes into the soil. Pods will not develop unless there is darkness, mechanical resistance and moisture.

Botanical Types

Peanuts are divided into two broad botanical types based on the following differences:

- The branching pattern of the plant
- The dormancy of the seed
- The maturity of the plant

The **Virginia** group do not produce flowers on the central branch, but only on the lateral branches. The seeds show some dormancy and the crop is relatively late maturing (130 to 170 days). Within the Virginia group there are both erect and runner (prostrate) types.

The **Spanish** group produce erect plants with flowers on both the central and lateral branches. The seeds of the Spanish group show little dormancy and the crop is early maturing (100 to 130 days).

VARIETIES

The Peanut Company of Australia is the major investor in the Australian Peanut Genetic Improvement Program. This program is also assisted by the Grains Research and Development Corporation (GRDC) and Queensland Department of Agriculture and Fisheries (QDAF). In addition, the Peanut Company of Australia maintains close collaborative links with a number of overseas breeding programs that enables access to the latest peanut genetics.

Hi Oleic

Hi Oleic is a reference to the relative levels (or O/L ratio) of oleic and linoleic acid in the peanut kernels. The balance of these two oils determines the increase in rancidity over time i.e. keeping quality or shelf life. Older peanut varieties have an O/L ratio of 1 - 2. Newer varieties have an O/L ratio of 20 – 40. This greatly improves their shelf life and flavour.

All varieties available from PCA are Hi Oleic.

Please refer to the following table for a summary of varietal information. More details on each variety are available from PCA.

PEANUT VARIETY SUMMARY 2015/16

						GENERALLY RECOMMENDED FOR:			SUSCEPTIBLE TO:	
VARIETY	TYPE	WEEKS (DAYS) TO MATURITY SOUTH QLD (APPROX)	GROWTH HABIT	PEG STRENGTH	SEED SIZE	DRYLAND – SOUTH QLD	NORTH QLD IRRIGATED & HIGH RAINFALL DRYLAND	IRRIGATED CENTRAL & SOUTH QLD	LEAF DISEASES	SOILBORNE DISEASES
Wheeler PBR	Virginia	20 (140)	Erect	Medium	Large	Yes	No	Yes	Yes (Highly susceptible to net blotch)	Yes, maybe some tolerance to CBR
Middleton PBR	Virginia	19 (135)	Semi-erect	Medium	Large	Yes	No	Yes	Yes (Highly susceptible to net blotch)	Some tolerance to Aflatoxin Incidence
Fisher PBR	Virginia	21 (147)	Semi-erect	Medium	Large	Yes	No	South Qld only CQ - No	Yes (Some tolerance to net blotch and leafspot)	Some resistance to CBR Tolerance to Sclerotinia
Menzies PBR	Runner	20 (140)	Semi-prostrate	High	Medium	No	Yes	No	Yes	Some tolerance to CBR and White Mould
Holt PBR	Runner	21 (147)	Semi-prostrate	High	Medium - Large	Yes (Consult Agronomist)	Yes	Yes	Yes	Some resistance to CBR. Some tolerance to Sclerotinia and White Mould
Page PBR	Runner	19 (135)	Semi-prostrate	High	Medium	Yes (Consult Agronomist)	Yes (Consult Agronomist)	Yes	Yes	Some resistance to CBR Tolerance to Sclerotinia, White Mould & Fusarium
Redvale PBR	Ultra Early	17 (119)	Erect	High	Medium	Yes (Consult Agronomist)	Yes (Consult Agronomist)	Yes (Consult Agronomist)	Yes Limited tolerance to rust (Susceptible to net blotch)	Susceptible to CBR

** This table is a guide to varietal selection. Please consult your Peanut Agronomist for specific recommendation on varieties for your farm.*

PBR

PBR = PLANT BREEDERS RIGHTS

These varieties are protected under the Australian Plant Breeders Rights Act 1994 and the regulation therein.

Other key considerations for Variety Selection:

- Redvale presents a valuable variety option for growers in all regions to consider
  - In dryland areas in S Qld, Redvale can avoid end-of-season drought and hence aflatoxin risk, yet can still produce a high yielding crop with good grades in above average seasons. PCA recommends dryland growers consider a combination of Redvale and a full season variety (e.g. Middleton) to manage the climate risk.
  - In Coastal regions, Redvale offers an early maturing option for early/late planting to allow a legume break crop to better fit into a cane system. It will use up to 30% less water and fungicides, yet still yield >5t/ha if managed properly.
  - In N. Qld, Redvale has performed very well under wet conditions. It is a definite option where a grower wants to minimise crop inputs (irrigation, fungicides) yet still have the potential for yields of >4.5t/ha.

CROP YIELDS AND QUALITY

A peanut grower's income is determined largely by the yield and quality achieved. Like many crops, substantial variations in yield may exist. Climatically some areas may have different yield potential and differences do exist among varieties. However management factors are often a major determinant of final yield, so care must be taken with all aspects of growing the crop.

Similarly, kernel quality can be influenced by management factors. Growers are directly paid on their kernel quality so it is important that growers understand which management factors can directly affect their quality.

These include:

- Good crop rotation and freedom from disease.
- Good nutrition especially Calcium and Boron.
- Good irrigation management.
- Optimum maturity determination.
- Good harvesting conditions.
- Controlled drying.

On farm yield is normally measured in tonnes per hectare of farmers' stock peanuts which means unshelled pods (in-shell) cleaned of extraneous matter and at the moisture content used for grower payment calculation.

Under excellent conditions, the Runner and Virginia varieties are capable of yields above 7 tonnes per hectare. The Ultra Early varieties tend to yield less, but are still capable of yields of 5 tonnes per hectare.

The different varieties produce different levels of shell which growers should be aware of as they are not paid for their shell : Runners produce 19 to 22% shell; and the Virginias produce 22 to 25% shell. Well grown, irrigated crops will be on the lower end of shell percentage, whilst immature and drought affected crops generally exhibit higher shell percentages.

*SUITABLE SOILS

Peanuts in Australia have traditionally been grown on the red clay loams (Krasnozems) of the South Burnett and Atherton Tableland. These soils are naturally friable and have a good water holding capacity.

However, peanuts can be grown on a wide range of soils, provided the surface soil (the top 15 to 20 cm) is reasonably friable. Suitable soil types include sands, sandy loams and silty loams.

Irrigation may be used to manipulate the soil conditions, especially at pegging and at harvest.

Soils prone to waterlogging should be avoided as peanuts do not tolerate long periods of waterlogging. Peanuts prefer well drained soils. Planting on raised beds can help to alleviate minor waterlogging problems.

Heavy clay soils or hardsetting soils which break into large clods should be avoided as pods may be torn off the bush at digging. These loose pods cannot be recovered by the harvester. Heavy soil conditions may lead to high extraneous material levels in the load. This will incur penalties.

Heavy clays may also become non-trafficable for long periods due to wet weather. This can cause harvesting delays and potential yield losses.

*** Note:** New growers are requested to submit a soil sample from the intended paddock to Peanut Company of Australia prior to planting. This sample will be analysed for organochlorine pesticide residues. There is a fee for this analysis. Unacceptable levels of any chemical in peanuts delivered will render the crop unfit for human consumption and the load will be priced accordingly. Please contact PCA for further details.

CROP ROTATION

Growers are encouraged to adopt a regular rotation of crops with peanuts to avoid building up weed, disease and insect problems which occur under any system of monoculture.

The ideal rotations with peanuts include cereal crops like wheat, barley, oats, maize and sorghum. Sugar cane or a grass pasture phase is also a recommended rotation, provided volunteer peanuts are adequately controlled.

Crops like potatoes, navy beans or soybeans are not ideal long term sustainable rotations with peanuts because they tend to host many of the same pest and disease problems.

SEED BED PREPARATION

Peanuts produce a deep tap-root that is capable of exploiting moisture and nutrient reserves deep in the profile. Consequently soils prepared for peanuts should be free of any hard pans or compaction layers. Deep ripping is recommended to a depth of at least 45 cm.

Peanuts do not require a particularly fine seed bed due to the large seed, but good soil to seed contact is essential to encourage rapid and even germination. Press wheels on the planter are essential.

To encourage good crop establishment, the seed bed should be relatively even and free from weeds and excess stubble. Some growers are moving towards minimum tillage practices to protect the soil surface from erosion and to improve soil structure.

PLANTING

Peanuts are normally grown through the summer months, planted anywhere from September through to early January. The crop usually takes 18 to 24 weeks from planting to digging. Growing through the summer months means the crop can take advantage of any available rainfall.

Planning for the harvest is essential when determining when to plant. Planting should be timed to avoid rain at harvest and the likelihood of frosts.

In the Northern Territory, irrigated peanuts can also be planted in March and harvested in September.

Temperature

Temperature has a major influence on peanut growth and development. Peanut growth is favoured by warm temperatures in excess of 25°C. Dry matter production drops by about 25% when night temperatures reach 15°C and by 50% when night temperatures drop to 9°C.

Soil temperatures should be monitored regularly as planting approaches. Keep track of the soil temperature at the desired planting depth (e.g. 50 mm). Measure the soil temperature at 9 AM. Peanuts should only be planted if the soil temperatures at this depth are more than 18°C for at least three days in a row.

Fragile Seed

Care should be taken at all times when handling peanut seed. The seed is large and fragile and easily damaged. Never drop or walk on bags of peanut seed and don't leave the seed in direct sunlight.

Peanut seed is sold in 25 kg bags. The seed is treated with a fungicide to minimise the incidence of seedling diseases. PCA certifies that all of the company's peanut seed conforms to a minimum germination of 80% and is free from weed seeds.

Inoculation

Peanuts are able to fix nitrogen from the atmosphere via nodules on their root system. These nodules are caused by a strain of bacteria called Rhizobia which infect the plant's root system.

Native Rhizobia exist in many soils, but it is recommended that growers inoculate their peanuts to ensure good nodulation and an adequate supply of nitrogen. The strain used in the inoculant is an improved strain, designed specifically for peanuts (Group P) and is regarded as more effective than the native strains in the soil.

It is recommended that growers striving for maximum yields should inoculate their peanuts every season. This inoculant is available from PCA.

Water injection is the best method for applying the peat inoculant. Avoid mixing the inoculant up into a slurry and applying to the seed as the seed will be damaged using this method. Peat inoculant may also be sprinkled dry over the seed in the planter box at sowing although this is not recommended for vacuum planters.

Granular inoculant (when available) can be applied through the use of granular application boxes, commonly used for applying granular soil pesticides, etc. The application of granular inoculant and granular pesticides together is not recommended.

Row Spacing

Peanuts are traditionally planted in rows 90 cm apart. This is the standard row configuration and is the preferred spacing to minimise losses during harvesting. Most harvesting equipment is designed to handle rows 90 cm apart.

Despite this, some growers have planted row spacings ranging from 65 cm to 100 cm. Some growers have used a twin row planting configuration for plantings. Four rows are planted with the two outside rows 90 cm apart, and the two inside rows 70 cm apart. This configuration leads to faster canopy cover, reducing weed pressure, and generally improving yields. Twin row is particularly appropriate for Ultra-Early varieties.

Peanuts are normally planted on flat ground, but planting single rows on a hill or two rows on a bed can assist the digging process and improve drainage in wet areas.

The tables at the back of this guide indicate the planting rates and seed spacings required for peanuts.

Planting Equipment

A number of different row crop planters are suitable for peanuts. These include planters using an inclined plate like the Covington and Janke. These are simple but effective planters.

Rotary cone planters are also common and include the Mason Deere and KMC. These planters do not handle large seeds very well. Vacuum precision planters are now the most popular. These planters provide better seed placement and have a more accurate metering system. They include the Monosem and John Deere Max-Emerge. Nodet and Gaspardo vacuum planters must be modified to plant peanuts.

Most growers use four, six or eight row planters, but for large areas, planter configurations of up to twelve rows can be used.

CROP NUTRITION

Soil Testing is Essential

It is recommended that growers obtain a complete nutrient analysis or soil test prior to planting their peanuts. Peanuts are regarded as good scavengers for nutrients, but if any nutrients are lacking in the soil, including micronutrients, then yield potential may be limited.

Make sure your soil test is properly interpreted by a qualified agronomist. 'Incitec' soil tests are preferred.

The ideal pH range for peanuts is from 6.0 to 7.0. Soils that are more acidic than this (below pH 6.0) should be limed.

Phosphorus, potassium, calcium and sulphur are the most common nutrients applied to peanuts, but check magnesium and boron levels as these are becoming depleted in many Australian soils.

Micronutrients must not be ignored as they can sometimes lead to major yield losses if deficient. Zinc, Boron and Molybdenum are commonly used. Copper is often deficient on very sandy soils. Soil or foliar applications of micronutrients are used. On sandy soils, Manganese levels should also be checked.

Some phytotoxicity can occur with micronutrient applications, however this damage does not affect the crop.

Calcium

Due to their under-ground fruiting habit, peanuts have a relatively high requirement for Calcium. Calcium is not very mobile within the plant, so the peanut pod takes up its own Calcium directly from the soil. Consequently, available Calcium must be present in the podding zone (the top two to ten centimetres of soil).

Adequate Calcium is essential for ensuring high quality kernels. Insufficient Calcium may lead to smaller kernels and kernels with hollow hearts (not completely filled). Low Calcium will also reduce the germination of seed peanuts.

In larger seeded peanuts (Virginias), low Calcium can lead to kernel abortion, causing empty pods or "pops".

To provide an adequate supply of Calcium in the podding zone, Natural Gypsum (Calcium Sulphate) is usually applied at early flowering over the peanut row. Gypsum is a relatively soluble source of Calcium that is easily absorbed by the pods. Gypsum contains 18 to 20% Calcium and is applied at rates of 600 to 1000 kilograms per hectare.

Alternatively, fine Lime can be applied four to six weeks prior to planting (if soil pH is below 6.0) and lightly incorporated. Lime is less soluble than Gypsum. It is usually applied at rates of two and a half to five tonnes per hectare and contains 35 to 40% Calcium.

CHEMICAL USAGE

Legislation regarding chemical usage in agricultural crops is dictating that growers must be now more aware of their obligations for record keeping and responsible chemical use.

Growers need to ensure they fully read and understand the product label of all chemicals used, and to make sure they are being used in the correct manner, especially regarding harvest withholding periods and product rates.

It is now a **requirement** for peanut growers to submit a copy (either their own records or via filling out a generic PCA supplied form) of all chemicals applied to their peanut crop at the conclusion of each season. This information is all held in the strictest commercial confidence.

WEED CONTROL

Good weed control is essential in peanuts. Peanuts do not grow very tall and consequently do not compete very well with weeds. Unless good weed control is obtained, substantial yield losses may occur.

A large range of herbicides are registered for use in peanuts. Some of these are shown in **Table 1.** Correct use of herbicides has proved to be relatively safe and very effective against a diversity of both grass and broadleaf weeds. However, growers should avoid spraying broadleaf herbicides during the main flowering period if possible.

Mechanical cultivation is still used in many areas, however growers need to be careful of root pruning and especially of throwing dirt up against the plant stem during cultivation. These activities have been shown to exacerbate several soil-borne diseases, e.g. White Mould.

Table 1: **Some example herbicides that can be used to control various weed types at different stages of crop development.**

Time of Application	Main Type of Weeds	Some Trade Names	Product Rate	Comments
Pre-planting	Grasses and some Broadleaf	Treflan®	2.1 L / ha	Mechanically incorporated
Pre-emergence	Grasses and some Broadleaf	Dual Gold®	2.0 L / ha	Needs rain or irrigation within 10 days
Post-emergence	Broadleaf	Blazer®	1.0 - 2.0 L / ha	Causes some burn
Post-emergence	Broadleaf	Basagran®	1.0 - 2.0 L / ha	Use wetter
Post-emergence	Broadleaf	Buttress (2,4-DB)	1.3 – 1.7 L / ha	Use wetter
Post-emergence	Grasses	Verdict plus Uptake Oil®	0.15 L / ha 0.5 L / ha	Very cost effective product
Post-emergence	Grasses	Fusilade Forte®	1.24 - 1.65 L / ha	Use wetter
Post-emergence	Nutgrass	Spinnaker®	100 – 140 grams / ha	Plus 1 L / ha Hasten (crop oil
Post-emergence	Grass, Broadleaf and Nutgrass	Flame®	2 – 400 mls / ha	Plus 1 L / ha Hasten (crop oil)

DISEASE MANAGEMENT

There are a number of different diseases that may affect peanuts. However the effect of most of these diseases can be limited through good management and an appropriate fungicide strategy.

Seedling Diseases

The young seedling is normally protected by the seed dressing (a fungicide). A common seedling disease is Crown Rot (*Aspergillus niger*) which is endemic in most soils. It often kills very weak seedlings and is very prevalent when soil temperatures are high.

Foliar Diseases

The main foliar diseases are Leafspot, Rust and Net Blotch. If left uncontrolled, these diseases can be devastating causing total loss of leaf, weakened peg strength, loss of pods and eventual death of the plant.

However, a number of fungicides are available which if incorporated into a regular spray schedule, or if used on a timely but strategic basis, can provide excellent crop protection.

Table 2: Some examples of products registered to control foliar diseases in peanuts.

Diseases	Some Registered Products	Some Recommended Rates
Rust & Leafspot	Bravo 720®	@1.1-1.8 L / ha
	Folicur®	@0.2-0.44 L / ha
	Amistar Xtra®	@0.5-0.75 L / ha
	Alto®	@0.4-0.6 L / ha
Net Blotch	Bravo 720®	@1.1-1.8 L / ha
	Folicur®	@0.2-0.44 L / ha

Soil Borne Diseases

There are several soil borne diseases that can lead to substantial yield and quality loss. Three diseases of particular consequence are White Mould, Sclerotinia and Cylindrocladium Black Rot (CBR).

While there are some products available which can lessen the effects of these diseases, the best policy is to follow a recommended rotational program (involving grass or cereal crops) and practise good cultural management. In particular, excessively aggressive cultivation should be avoided, especially where soil is pushed against the plant.

Sclerotinia can be particularly devastating in some areas. It is recommended that a registered fungicide spray (e.g. Rovral @ 1 L/ha) be applied as a protectant before symptoms appear. This may be as early as when the crop is six to eight weeks old, or when the first flower petals drop. One or two follow up fungicide applications may be required if symptoms develop.

Aflatoxin

Aflatoxin is a naturally occurring toxin produced by the fungi - *Aspergillus flavus* or *Aspergillus parasiticus* - both of which are widespread in most soils. Aflatoxin contamination of peanuts may result in a serious downgrading of the quality of a load of peanuts and consequent reductions in pricing.

Pre-harvest Aflatoxin contamination most commonly occurs when there is a drought stress during the last four to six weeks of the growing season. Higher soil temperatures (29 to 35°C) during the maturation process also encourage Aflatoxin contamination.

To prevent this infection, farmers are encouraged to grow their peanuts under irrigation (where possible). This not only prevents drought stress, but also cools the soil during the last weeks of growth.

Other factors which can help prevent Aflatoxin include:

- Use of Gypsum has been shown to decrease the incidence of Aflatoxin.
- Do not plant peanuts outside the wettable area of irrigation paddocks, e.g. past the wet edge of a centre pivot irrigator.
- Control soil insects which can damage pods.
- Control weeds that may be a problem at harvest, especially Wild Gherkin, Wild Cucumber and Wild Gooseberry (all of which are higher in moisture than peanuts).
- Harvest the peanuts as relatively soon as possible (ideal moisture content for harvest is 12-16%).
- Dry peanuts evenly and gently.

- Keep threshers, bins, trucks etc. free of any old peanuts or organic matter.
- Pre-clean peanuts prior to delivery.

INSECT MANAGEMENT

In traditional peanut growing areas, foliar insect pests have not been a major problem. However this has changed in recent times as peanuts have moved into new production areas, especially those which have been predominantly cotton or horticultural growing areas.

Foliage Feeders

The main foliage feeders tend to be Heliothis (*Heliocoverpa sp.*) and Cluster Caterpillar (*Spodoptera sp.*). Large numbers of these larvae (more than six per metre) can be damaging when the plants are very small and control measures may be warranted.

Growers also need to check crops carefully during the main flowering and pegging period. These insects will attack both flowers and pegs and can reduce yield potential. Control may be warranted if there are more than two larvae per metre of row.

In North Queensland, Redshouldered leaf beetle (*Monolepta australis*) can be a regional pest of significance. They have a short lifecycle and generally come in two populations throughout the season. Expect heaviest pressure in paddocks adjacent to avocadoes and other tree crops. A preventative approach to management is recommended; manage the pest in the tree crop (where registered control options are many). Effective insecticide options in peanuts are few, however for latest information please consult PCA agronomists.

Sucking Insects

A number of sucking insects will attack peanuts and are often responsible for the spread of viruses. The most commonly observed are the Vegetable Jassid and the Lucerne Leafhopper. These can attack the crop at any stage and often build up to huge numbers. Growers often overlook these pests because they are small and not easily seen, but in large numbers they can cause significant crop damage. If 25% or more of the crop's leaves have small yellow spots or stippling, and or the leaves are turning yellow at the tips and margins, then chemical control measures may be warranted.

Thrips, Mirids and Mites can also be a problem in some areas. Regular scouting of the crop is essential to determine if control measures are warranted.

Soil Insects and Pod Damage

In some parts of Queensland White Fringe Weevils can cause severe damage. The larvae of the Weevil attack the taproot of the plant. This may cause either direct death of the plant or indirectly lead to its demise by providing an entry site for diseases like CBR. The larvae will also chew pegs and developing pods. The best strategy for managing this pest appears to be to control the adults before they lay their eggs.

Various Whitegrubs and Canegrubs will also feed on roots, pegs and developing pods. Mechanical cultivation can be useful in controlling some of these pests and some soil applied insecticides may also be warranted.

Etiella moths and larvae may be common on some of the sandier soil types and is often especially active against the Runner varieties. The adult Moth lays its eggs on the peanut plant. The larvae hatch and move down the plant into the soil to feed on the pods. Growers should check their crops at least a month prior to harvest. In extreme cases, the crop may have to be dug early. Irrigation is the best form of defence against this pest.

IRRIGATION

Peanuts are considered to be a relatively drought tolerant crop. They have various physiological mechanisms for avoiding the effects of drought and an extensive root system which is able to exploit moisture reserves at depth. Even in droughted seasons, peanuts will nearly always produce some yield.

However, few growers can afford mediocre yields because of the high level of input costs. Peanuts are best grown where the rainfall is reliable or where access to irrigation is available.

What Will Irrigation Do?

- Improve Yield.
- Improve Quality.
- Reduce Aflatoxin.
- Improve Profit Reliability.
- Reduce Risk of Poor Yields and Returns.

Irrigation Requirements

Peanuts need 600 to 700 mm of water over the season for a high yielding crop. This can come from either rain, irrigation or stored soil moisture. However it is not the total amount of moisture that the crop receives that is most important. Timing of rainfall or irrigation can have a dramatic effect on both crop yield and quality.

Table 3 : **Growth stages and irrigation needs of peanuts**

Growth Stages	Irrigation Requirements
Germination & Emergence	Good moisture conditions are required. Irrigation can ensure crop is planted on time.
Vegetative	Peanuts can tolerate mild water stress at this stage. Stress at this stage may be beneficial.
Peg Initiation	No water stress at this stage, very sensitive. Use irrigation.
Pod Formation and Filling	No water stress. Use irrigation.
Maturity	Decreasing water use as the crop matures.

Irrigation scheduling using a system of pan evaporation measurements and crop factors has been found to be very effective. Devices which provide indirect measurements of soil water can also be very useful including tensiometers, Gypsum blocks and Enviro-scan probes.

Irrigation Systems

If water is available then it can be used to improve peanut yields and returns. The main systems currently used for irrigating peanuts include: furrow irrigation or various forms of sprinkler irrigation including centre pivot, lateral moves, travelling irrigators or solid set sprinklers.

Furrow Irrigation is the least capital intensive system of irrigation, but requires relatively flat land (not greater than about 2% slope). The main requirement for furrow irrigation is that the land is reasonably level to ensure uniform application. This may involve laser levelling and drainage work.

Sprinkler (Overhead) Irrigation systems are the main systems used in peanuts. They can include handshift and solid set spray lines, travelling booms, water winches, centre pivots and lateral move irrigators.

Trickle Irrigation has occasionally been used as a method of irrigation. A trickle line or tape is buried at a depth of about 20 cm below the surface of the soil. Water rises up into the pegging zone by capillary action. This technique can provide very precise irrigation. There has also been some success with trickle tape laid on the surface next to the plant row. Water use can be lower than furrow or sprinkler systems.

The cost of tape and installation together with mainline and filters can be more than other irrigation systems. Please consult PCA agronomists for further information.

DETERMINING PEANUT MATURITY

Peanuts are an indeterminate crop which means that from about four weeks onwards the crop will continue to flower and grow vegetatively together. It is very common for the crop still to be flowering at harvest. As the crop therefore does not mature evenly it can be difficult to determine exactly when to dig.

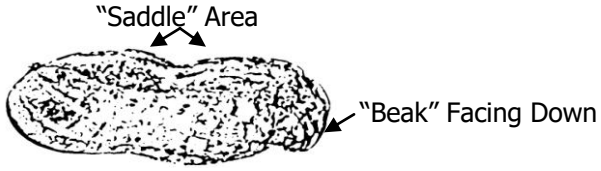
If the crop is dug too early, significant weight and quality loss may occur because the pods have not properly filled out. If the crop is dug too late, the peanuts may be over-ripe and often the largest and best pods are left in the soil during digging.

Hull Scrape Test

The most common method for determining crop maturity is called the hull scrape test. This involves taking note of colour changes under the outer skin of the shell to indicate kernel maturity.

The outer skin of the pod (exocarp) is removed which exposes the colouring underneath. The exocarp can be removed by scraping the pod with a pocket knife; or "blasting" the pods with the stream of water from a high pressure water cleaner. The pods are usually placed in a mesh basket while the exocarp is removed.

It is important to note the colour in the saddle area of the pod. This is where the colour changes first occur on the pod.



The colours which occur are:

Black	➡	Mature to Overmature
Dark Brown	➡	Mature
Orange / Light Brown	➡	Close to Mature
Yellow	➡	Immature
White	➡	Immature to Underdeveloped

Approximately 200 pods should be scraped. This means digging carefully by hand at least six or seven representative bushes from different parts of the paddock. Excess soil should be removed (usually by washing). All pods with a diameter greater than that of a ball point pen (i.e. five to eight mm) should be removed. Growers should take note of the peg strength as each pod is removed.

Pods should be placed in maturity categories as they are scraped. The colours will fade as the pods dry out so keeping them moist will avoid this. Sometimes it is difficult to tell the difference between orange and brown. Colour charts are available for colour comparisons. Alternatively growers can shell out any of the peanuts they are unsure of and look at the inside of the shell and the kernel.

Peanuts that are mature will be dark brown inside the pod and the seed coat will be thin and tight on the kernel. With experience growers will become more adept at picking the maturity differences.

Growers must consider the other factors listed below in determining when to dig, but as a general guide the crop is ready for digging when the following maturity levels are reached:

Virginia Varieties	➡	Dig when 60 to 65% brown and black
Runner and Ultra-Early (Spanish) Varieties	➡	Dig when 65 to 80% brown and black

WHEN TO DIG

The hull scrape test must be used as a guide only for determining when to dig. Other factors will also influence the decision and these include:

- Peg Strength
- Disease (Bush health)
- Weather Conditions
- Soil Conditions
- Area to be Harvested

All of these factors must be considered together when determining when to dig.

Peg Strength

The peg extends from the branches of the peanut plant and is the "lifeline" which connects the pod, below the soil, to the rest of the bush. If the peg becomes weak and detaches from the pod, then these pods cannot be recovered during harvesting and are lost.
The main factors which reduce peg strength include:

- Over-Maturity.
- Foliar Disease.
- Soil Borne Disease.

To test peg strength, carefully dig several bushes from different parts of the paddock (usually when collecting the maturity sample). Shake the bushes to simulate the mechanical digging action. If a significant number (10 to 20%) of the pods fall off then peg strength is declining and urgent digging may have to be considered. It is still important to do the hull scrape test though as this may still determine the final digging date.

Disease

Sometimes it is evident that disease is spreading rapidly through the crop and there is not sufficient time to wait for the crop to mature properly. In such situations a decision may have to be made to dig the crop early to salvage these peanuts.

Weather Conditions

Growers must take into account the expected weather conditions when determining when to dig. For example if prolonged wet weather is forecast, it may be better to dig a little early and have the peanuts properly inverted in a windrow, rather than still in the ground. This may be especially so if the crop is diseased.

Soil trafficability following heavy rain must also be considered in determining when to dig.

Soil Conditions

Growers must sometimes dig based on their experience of when their soil is most friable. A soil that sets very hard when dry may make it almost impossible to avoid large losses when digging. Sometimes it may be necessary to irrigate and dig such paddocks before they become too dry.

Heavy soils usually only have a 'narrow window' available in which to harvest in relation to soil moisture.

Area To Be Harvested

If a grower has a very large area to be harvested and they appear to be maturing all at once, it may be necessary to dig some paddocks earlier than the optimum in order to avoid losses from the last dug peanuts being overmature.

DIGGING AND INVERTING

A specially designed digger or puller is used to remove the peanuts from the soil. These machines are linkage mounted and may come in two, four or six row configurations. Cutter blades are usually either attached to the digger or they can be mid-mounted on the tractor. It is essential to keep these blades sharp and check that they are not cutting either too deep or too shallow.

During digging the taproot of the plant is cut just below the level of the peanuts and the soil around the pods is loosened. The bush, with pods attached is usually carried to the back of the digger where it is then inverted. This leaves the peanuts lying in a windrow. Two rows of peanuts are normally combined into one windrow.

It is important that the peanuts are properly inverted as this allows good air circulation to facilitate drying. If the peanuts are well inverted they are less likely to be damaged if it does rain. It also keeps the pods up away from the soil surface for easier harvesting and a cleaner sample.

WINDROW CURING

Peanuts usually contain 40 to 50% moisture when dug. The peanuts are left inverted in the windrow for several days to bring this moisture content down to the optimum for threshing which is around 12 to 16%. This may take between three to ten days, depending on the prevailing weather conditions.

Growers who do not have access to dryers often have to let the peanuts dry down to 10% moisture in the windrow. This may take from five to 14 days. The risk of damage to the crop from inclement weather conditions increases, the longer the crop remains in the paddock. Also, as the crop dries down below 12% the pegs may become weaker and more brittle and crop losses are likely to increase.

In addition, the risk of aflatoxin contamination is much higher if the peanuts are left more than a few days in the windrow. The best option is always to thresh early and artificially dry.

PCA has drying facilities available at its intake depots.

THRESHING

Threshers or peanut combines are designed to pick up the windrow from the paddock and separate the pods from the bush. The pods are delivered to a bin on top of the thresher while the bush is carried out of the machine and either spread over the paddock or dropped in a windrow for hay baling.

Threshers come in configurations from two up to eight rows. Most of the modern machines are imported from the USA and are attached to the draw bar and hydraulics of the tractor. AMADAS Industries and John Deere, however, have also developed self propelled threshers in either six or eight row configurations.

The ideal moisture content for threshing is about 12 to 16%. Below 12%, threshing losses can increase from the pick-up; pods and kernels may be damaged and the incidence of loose shell kernels (LSK's) increases.

The thresher should be checked and maintained regularly. Excessive drum speed can also result in damaged pods. In addition, fans and blowers may need appropriate adjustments.

Peanut Company of Australia (PCA) can arrange for contract harvesting of crops in some areas, provided there is sufficient tonnage to justify the contractor's involvement.

PRE-CLEANING

Pre-cleaners are specifically designed to remove dirt, sticks, stones and other extraneous matter from a load of peanuts. They usually consist of a set of rollers and screens and sometimes also use blowers to remove the extraneous matter. Pre-cleaning a load prior to drying makes curing much more efficient and uniform and overcomes problems with wet spots in the load.

Pre-cleaning will often remove many of the LSK's and immature pods that tend to harbour aflatoxin infection. Many growers have found that by pre-cleaning they can dramatically decrease the incidence of aflatoxin in their loads.

For growers who are a long distance from PCA's receival depots, pre-cleaning ensures that growers are not paying freight on dirt and extraneous matter. Many new growers have commented that they have paid for their pre-cleaner over several years through savings made on freight.

PCA pays a small bonus for very clean peanuts.

DRYING OR CURING

To produce peanuts of optimum quality, most growers artificially dry their loads. Regular checks are required as overdrying leads to kernel damage (especially splits) which results in lower payments. Peanuts that are not dried to the proper intake moisture ready for delivery will have to be dried after delivery. Peanut Company of Australia has facilities in Kingaroy, Gayndah and Tolga for contract drying. Growers should make sure they book their loads in for drying with the depot's intake officer.

To maintain quality, loads must be dried slowly and carefully under controlled conditions. The following guidelines should be followed:

1. Pre-clean loads to remove dirt.

2. Start drying within six hours of threshing to prevent aflatoxin development.

3. Keep an even depth of peanuts over the dryer floor.

4. Air temperature in the plenum should not exceed 11°C above ambient temperatures (up to a maximum of 35°C).

5. The moisture removal rate should not exceed 0.5% per hour.

6. The relative humidity of the drying air should be between 50 to 65%.

7. Use a minimum air flow of 200 litres per second, per cubic metre of peanuts.

8. Regularly check the temperature and humidity in the air tunnel.

9. The peanuts must have time to equilibrate following drying and before delivery (at least 24 hours).

10. Regularly check the moisture content of the peanuts.

Moisture Content

The moisture content of peanuts is normally determined on an 'in-shell' basis. PCA uses the in-shell method, but also determines the moisture content of growers' loads on a kernel basis for comparison.

A range of moisture meters are available for purchase by growers and these can be calibrated with PCA's moisture meter. **PCA has the Dickey-John Mini-GAC Portable Moisture Tester available for purchase.** (This machine can test the moisture in a range of crops as well as peanuts.)

DELIVERY TO PEANUT COMPANY OF AUSTRALIA

Delivery may be made to PCA's receival depots at Kingaroy or Tolga. Loads must be booked in with the Intake Officer and meet the requirements of the Intake Policy circulated to all growers at the commencement of each season. At intake the load is weighed and a docket issued as a record for future payment.

Farmers' stock peanuts (in-shell) must be dried to a moisture content of 10% or below (kernel moisture content of 8.5%) for delivery in South Queensland; and 9.5% or below (kernel moisture content of 8%) for delivery in North Queensland. At moisture contents above these, peanuts cannot be safely stored.

INTAKE AND GRADING

The truck is first weighed and then sent to be tipped. As the load is tipped a continuous representative sample is taken by a mechanical sampler. Moisture content and aflatoxin status are determined from this sample. This sample is weighed, extraneous matter determined and then graded. For privacy purposes growers names are not shown on these samples. Each sample has a tag which shows a distribution number, variety, moisture content and segregation. Payment is based on the grading from this sampling.

MARKETING OPTIONS

Contract options for marketing are based on a price for each grade of peanuts in the load. For example:

Snackfood	(Jumbo)] (Grade 1)] (Grade 2)]	} Edible Kernel Portion
Manufacturing	(Grade 5 Splits)] (Grade 7 MFG)	
Oil	Through Sieve Hand Picked	Oil Crushing

This grading system applies to all varieties of peanuts, that is, Virginia, Runner and Ultra-Early. Payment is made on the basis of kernel weight and quality as determined from the sample taken at Intake. Refer to the copy of the Grading and Receival Advice following.

Jumbo, Grade 1 and Grade 2 refer to the size categories in each peanut type. Although this grading system applies to all peanuts, a Jumbo in a Virginia variety (750 kernels per kg) is a different size to a Jumbo in a Runner variety (1300 kernels per kg) and does not have an equal payment.

Contract

Contracts are on a hectare basis and offer flexible payment terms depending on growers individual requirements.

Grower's payments are processed through the Kingaroy Office and any queries regarding the payment system should be directed to the growers local PCA representative or Grower Payments Officer, Kingaroy.

Grading and Receival Advice

The following page (page 29) contains an example of the Grading and Receival Advice. Growers receive one of these advices for each load and they contain all the information relating to that load i.e. weight, moisture, Aflatoxin segregation, gradings and total value.

When a payment is made, it will be based on the total value on the Grading and Receival Advice at the percentage due for payment showing on the particular contract that has been selected by the Grower. **All Grading and Receival Advices should be retained for taxation purposes and to cross-reference the Payment Statement.**

All payments for peanuts produced are free of GST. Peanut seed, inoculant, pallets etc and any harvesting services will include GST and will appear on a Tax Invoice.

Legume Research Levy

A levy of 1.005% of the 'Farm Gate' payment weight value of each load is paid by peanut growers. This money is paid to GRDC (Grains Research Development Corporation) and then combined with funding from the Commonwealth Government. The funds are used for peanut research (e.g. Peanut Breeding Program and Agronomy).

GRADING AND RECEIVAL ADVICE

PEANUT COMPANY OF AUSTRALIA LIMITED
ACN. 057 251 091 ABN 34 057 251 091
Haly Street, Kingaroy, Qld. 4610 Australia
P.O. Box 26, Kingaroy
Phone: (07) 4162 6311, Fax: (07) 4162 4402

GRADING AND RECEIVAL ADVICE
TAX INVOICE

Contract No :

Sample No.
Variety HO
Segregation 1
NIS Moisture 10.10%
Kernel Moisture 10.00%
Delivery Date 29-JUN-2013
FStock Docket
Grower No.
ABN:

Partnership Name:

Division of Proceeds

	Kgs	
Weighbridge Weight	40270	
Extraneous Material	-2460	6.11
Loose Shelled Kernels	-906	2.25
Cleaned Weight	36904	91.64
Excess Moisture	-1266	
Payment Weight	35638	
Nut in Shell Content	0	
Sub Total	35638	
Shell	7805	
Kernel Payment Weight	27833	

ESTIMATED OUTTURN	%	Kgs	Cents/Kg	Amount
VIS	.00	0	0.0000	0.00
JUMBO	53.90	19209	128.0000	24587.52
GRADE 1	2.30	820	128.0000	1049.60
GRADE 2	1.10	392	128.0000	501.76
MFG	0.60	214	40.0000	85.60
SPLITS	15.10	5381	110.0000	5919.10
OIL -TS	2.40	855	15.0000	128.25
OIL - HP	2.70	962	15.0000	144.30
Total Kernel	78.10	27833		32416.13
SHELL	21.90	7805		
Gross Payment		35638		32416.13
Adjustments				
LSK	2.25	906	10.00	90.60
Nett Payment (Average $/T = 912)				32506.73
Less Legume Research Levy (1.005%)				326.69
Payment After Levy (GST Free)				32180.04
Your share is 100.0%				32180.04

PEANUT CROP MANAGEMENT TABLE

CROP STAGE-WEEKS			0	2	4	6	8	10	12	14	16	18	20	22
GROUND PREPARATION	Deep Ripping													
FERTILISER	Soil Test	Lime and/or Pre-plant fertiliser			Gypsum									
PLANTING			Plant											
WEED CONTROL		Pre-plant incorporated	Pre-emergent	Post-emergent Applications										
FOLIAR DISEASE CONTROL					Regular scheduled applications of foliar fungicides for Leafspot, Rust, Net Blotch									
SCLEROTINIA CONTROL														
IRRIGATION REQUIREMENT			HIGH	LOW		HIGH							MODERATE	
DIGGING										Digging				
THRESHING											Threshing			
GROWTH STAGE FOR A 20 TO 22 WEEK VARIETY			Emerge	Vegetative Growth										
					Flowering and Pegging									
							Pod Development							
													Wheeler	
													Middleton	
													Menzies	
													Holt	
										Redvale			Page	
													Fisher	

TABLES FOR PLANTING CALCULATIONS

Seed size or grade is measured by the number of seeds/kilogram.

PLANTING RATES KG/HA

Planting Population	Number of Seeds/kilogram				
	1060	1100	1350	1400	1900
No. of Seeds/Ha	kg/Ha	Kg/Ha	kg/Ha	kg/Ha	kg/Ha
	Planting Rate kg / ha				
200,000	188	182	148	143	105
180,000	170	164	133	128	95
160,000	151	145	118	114	84
140,000	132	127	104	100	74
120,000	113	109	89	86	63
100,000	94	91	74	71	52
80,000	75	73	59	57	42

Example: If you want to plant at 120,000 seeds/ha then at a seed count of 1060 seeds/kg you will need 113kg/Ha OR if you have 1400 seeds/kg you will need 86 kg/ha.

SEED SPACING (SEEDS PER METRE)

Planting Population	Row Spacing (cm)					
	76.2	81.3	86.4	91.4	96.5	101.6
No. of Seeds/Ha	(30")	(32")	(34")	(36")	(38")	(40")
	Planting Rate seeds / metre					
200,000	15.2	16.3	17.3	18.3	19.3	20.3
180,000	13.7	14.6	15.6	16.5	17.4	18.3
160,000	12.2	13.0	13.8	14.6	15.4	16.3
140,000	10.6	11.3	12.1	12.8	13.5	14.2
120,000	9.1	9.7	10.3	10.9	11.5	12.1
100,000	7.6	8.1	8.6	9.1	9.6	10.1
80,000	6.1	6.5	6.9	7.3	7.7	8.1

Example: If planting on 91.4cm row spacing and you want to plant at 120,000 seeds/ha then you will need to plant 10.9 seeds/metre to achieve that planting rate

PEANUT PRODUCTION AREAS

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