

# APPENDIX C: LANGUAGE USED IN THE AUSTRALIAN WHEAT INDUSTRY

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## KEY POINTS

- Wheat is Australia's largest cereal crop
- In 2013–14 there was 13.5m Ha planted in Australia producing 22m tonnes at a value of about \$7.5 billion
- Wheat has a higher protein level than most other cereals
- Protein is a key determinant of grain quality and has a big impact on the products that can be made from processed flour
- Wheat yield and quality is an outcome determined by the genetic potential of the variety interacting with the environment ( $P=G \times E$ )
- There is a detailed process for classifying varieties by growing zone (region) – undertaken by Wheat Quality Australia
- Wheat trading standards are also in place and managed by Grain Trade Australia
- There is a huge array of wholesale and retail consumer products derived from wheat

## WHEAT PRODUCTION

Wheat is grown throughout many regions of Australia – south east Queensland, New South Wales, Victoria, south east South Australia and the wheat belt of Western Australia. Wheat grown in Western Australia is mostly exported while about 40% of wheat grown in the eastern regions of Australia is used for domestic consumption and animal feed. The major export markets for Australian

wheat are in the Asian and Middle East regions, including Indonesia, Japan, South Korea, Malaysia, Vietnam and Sudan. In 2013–14, Australia had over 13.5 million hectares planted producing approximately 22 million tonnes of wheat with a gross value reported at over AU\$7.5 billion.

## CHARACTERISTICS

Wheat grain is a staple food used to make flour for breads, baked goods, breakfast cereal, pasta and noodles; for fermentation to make beer and other alcoholic beverages; and as a stock feed. Wheat has a higher protein content than most other cereals and it is protein levels that is the

major quality determinant – with protein levels largely dictating the type of foodstuff that can be best prepared from it.

The protein level of wheat is directly related to the variety of wheat planted and the environment in which it is grown.

# VARIETIES

There is a wide range of wheat varieties for farmers to choose from, with individual research required to determine the most suitable variety for the environment and end use. Sources of information of wheat varieties grown in Australia can be found from Anon (nd, a):

- National Variety Trials – online database, visit [www.nvtonline.com.au](http://www.nvtonline.com.au)
- State department of Primary Industries variety guides
- Companies that market varieties
- Local advisors and agronomists

Most wheat varieties are covered by Plant Breeders Rights and a royalty or fee is payable to the breeder of the variety for every tonne of grain produced. The point of collection for this royalty or fee may differ between varieties and growers need to be aware of the arrangements for the variety they grow.

Each year, all varieties of wheat are classified into grades by specific growing zones (regions). These classifications are the responsibility of Wheat Quality Australia Limited (WQA) (Anon nd, b). WQA is an independent not for profit company that was established and owned by Grains Research and Development Corporation (GRDC) and Grain Trade Australia Limited (GTA) and has been responsible for wheat variety classification and related activities since January 2011.

WQA produce a Wheat Variety Master List (Anon nd, c) which classifies all varieties into a class or grade based on processing and end product quality and determines the highest grade that a variety can be accepted into at delivery by zone, as indicated below (these are the first of hundreds of varieties listed).

The Classification System is updated several times a year and aims to deliver grain of consistent physical quality, processing performance and end-product quality to customers and end-users.

CODE	VARIETY NAME	WESTERN ZONE	SOUTHERN ZONE	SOUTH EASTERN ZONE	NORTHERN ZONE	CLASSIFICATION YEAR	REVIEW DATE
540	KIORA	APW*	AH	AH	APW*	2014	2024
539	CONDO	APW*	AH	AH	AH	2014	2024
538	SUNMATE	APW*	APW*	AH	APH	2014	2024
537	MITCH	APW*	APW*	APW	AH	2014	2024
536	SUPREME	ANW	FEED*	FEED*	FEED*	2014	2024
535	VIKING	APW*	APW*	APH	APH	2014	2024
534	DBA AURORA	FEED	ADR	FEED	ADR	2014	2024
533	HARPER	APW	APW	ASW*	ASW*	2014	2024
532	SCENARIO	FEED	FEED	FEED	FEED	n/a	n/a
531	ADAGIO	FEED	FEED	FEED	FEED	n/a	n/a
530	MANNING	FEED	FEED	FEED	FEED	n/a	n/a
529	TROJAN	APW	APW	APW	ASW*	2013	2023
528	LANCER	APW*	APW*	APH	APH	2013	2023
527	SHIELD	APW*	AH	APW*	APW*	2012	2022
526	GRENADE	APW	AH	APW*	APW*	2012	2022
525	SUNTOP	APW*	AH	APH	APH	2012	2022
524	DART	APW*	AH	APH	APH	2012	2022
523	PHANTOM	APW*	AH	APW	APW*	2012	2022
522	GAZELLE	AGP*	ASF1	ASF1	ASF1	2012	2022

# QUALITY – GRADES/CLASSES

Wheat grain quality is classified first by variety and then by various grain quality specifications such as protein concentration, screenings test weight, weather damage and foreign matter. The quality of the grain will affect the price achieved for the crop. Damage from frost, heat (due to high drying temperatures), black point and sprouting can affect the quality of the end product.

Wheat in Australia is classified into nine primary grades, although there are a range of sub-grades within each: Australian Prime Hard, Australian Hard, Australian Premium White, Australian Standard White, Udon Noodle, Durum, Australian Soft, General Purpose and Feed wheat, with the price paid for grain dependent on its classification.

The following table lists the classes of wheat and their main production zones (Wheat Quality Australia, 2013).

## *Classes of wheat currently available for classification by zone.*

Wheat Class	Classification zone
Australian Prime Hard (APH)	Northern and South Eastern
Australian Hard (AH)	All zones
Australian Premium White (APW)	All zones
Australian Standard White (ASW)	All zones
Australian Premium Durum (ADR)	All zones
Australian Soft (ASFT)	All zones
Australian Standard Noodle (ANW)	All zones
Australian Premium Noodle (APWN)	Western
Australian Feed (FEED)	All zones

Wheat delivered into the marketplace must meet certain grain quality specifications to be classified into the aforementioned grades as they are critical in determining flour yield and quality for different bread, bakery, pasta and noodle products (see 'Products' below). The following grain tests are applied at receival points to measure quality and ensure the high standards of Australian wheat grade classification are maintained (Queensland Department of Primary Industries and Fisheries, 2009).

**Protein content** – Protein content is assessed using near infra-red (NIR) technology on delivery to the silo, and payment is largely based on protein content. Wheat with 11–13% protein is used for pan bread, 10.5% for Udon noodles and 8.5–9.5% for biscuits and cakes.

**Protein quality** – Protein (gluten) quality differs between wheat varieties and thus production applications. For example, bread makers may require a wheat type with strong protein whilst a steam bun manufacturer may seek moderate protein strength. For millers, this is an extremely important quality characteristic as it affects flour water absorption and dough mixing characteristics. Protein quality is accounted for at the receival point by variety declaration.

**Falling number** – The falling number test is an indication of rain damage at harvest. Rain causes mature wheat grains to sprout and activates the alpha-amylase enzyme which breaks the starchy endosperm into sugars. In this test, wheat is ground, mixed with water and heated to form a gelatinous suspension. Wheat that has been weather-damaged forms a more viscous suspension and so has a lower falling number. End products are sensitive to flour with low falling numbers as it can result in dough stickiness, excessively dark bread or poor crumb texture and poor slicing ability.

**Screenings** – Impurities such as white heads, chaff, weed seeds, and shrivelled and broken grains may need to be removed before milling. Payment is influenced by screening levels as extensive grading adversely affects mill profit. Whilst some grain varieties are more susceptible to high levels of screenings, the environment in which the wheat is grown is a major contributor.

**Stained grains** – Enzymic discolouration such as Black point and staining caused by fungal infection such as *Fusarium*, *Eppicoccum* or *Drechslera* spp. adversely affects grain quality. In particular, black specks detract from the appearance of noodles.

**Hardness** – Wheat can be physically hard or soft. Hardness affects milling properties. Hard wheats are used to make pan breads, yellow alkaline noodles and flat breads. Soft wheats are used for biscuits and cakes. Variety declaration is used to segregate hard from soft wheat at receipt.

**Moisture content** – When wheat is delivered into a silo, moisture content is assessed at receipt using NIR technology—payment is also based on moisture content. Water content impacts on the value of grain (water versus flour) and affects the maintenance of quality during handling and storage.

**Test weight** – Test weight is also known as hectolitre weight and assessed by weighing a fixed volume of grain. Hectolitre weight informs the miller of the wheat's cleanness, plumpness and packing density, and guides the miller in predicting flour yield. The test weight varies between varieties due to their difference in size and shape. Shrivelled and rain-damaged grains reduce test weight.

Briefly the primary uses of classes of Australian wheat are:

- **Australian Prime Hard (APH)** – normally segregated and sold at guaranteed minimum protein levels of 13%. Produces high-protein Chinese-style yellow alkaline noodles, Japanese Ramen noodles, high-protein, high-volume breads and wonton dumpling skins.
- **Australian Hard (AH)** – segregated at a minimum protein level of 11.5 % is suitable for the production of a wide range of breads including European-style pan and Middle Eastern flat breads and a variety of bread products.
- **Australian Premium White (APW)** – minimum 10% protein level and hard grain characteristic is suitable for a wide range of products including varieties of Asian noodles such as Hokkien, instant and fresh noodles. It is also ideally suitable for the production of Middle Eastern and Indian-style breads and Chinese steamed bread.
- **Australian Standard White (ASW)** – versatile medium- to low-protein white wheat used in the production of a wide range of products including Middle Eastern, Indian and Iranian-style flat breads, European-style breads and rolls.
- **General Purpose (AGP)** – the General Purpose grade comprises wheat that has failed to meet minimum receipt standards for milling wheat grades, either on account of low test weights (68 kg/hl or below), presence of screenings, foreign material or a mild degree of sprouting. Falling number counts are generally at 200 or above. This product is general used in the feed grains industry.
- **Feed wheat** – consists of severely sprouted wheat deliveries with falling number tests below 200 and test weights at or below 62 kg/hl. Feed wheat is suitable for animal feed purposes.
- **Australian Durum (ADR)** – ADR1 consists of selected wheat varieties with vitreous, amber-coloured kernels with a minimum protein of 13%. It produces superior quality semolina ideally suited to the production of a wide range of high-quality wet and dry pasta products.

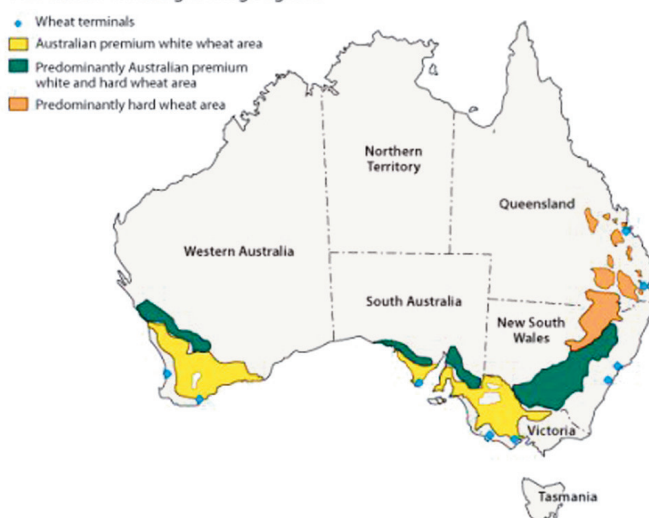
Key characteristics of each wheat class, their location of production, key markets and primary use in export markets is provided in the chart on the following page (Queensland Department of Primary Industries and Fisheries, 2009).

**Table 1. Australian Wheat Grades, Varieties and Share of Production**

Grade	States Grown	Production	Protein	Markets	Export Uses
APH Australian Prime Hard	QLD	<5%	13–14%	Japan, Korea, Thailand, Malaysia, Italy	Primarily used for Japanese style ramen noodles
	NSW				
AH Australian Hard	QLD	15–20%	11.50%	Japan, Indonesia, Iraq, Malaysia, Middle East	Suitable for a wide range of baked products including European pan breads, Middle Eastern flat breads, Chinese steamed products and Chinese yellow alkaline noodles
	northern NSW				
	southern NSW				
	Victoria				
	South Australia				
Western Australia					
APW Australian Premium White	QLD	30–35%	10%	Indonesia, Iraq/ Iran, Malaysia, Other Asian and Middle Eastern countries, Japan/Korea	Suitable for production of a variety of Asian noodles. It is also suitable for Middle Eastern and Indian style breads and Chinese steamed bread
	northern NSW				
	southern NSW				
	Victoria				
	South Australia				
Western Australia					
ASW Australian Standard White	southern NSW	20–30%	9–10%	Indonesia, Iraq/Iran, Malaysia, other Asian and Middle Eastern countries, Japan/Korea	Suitable for straight milling and blending purposes – typically in less discerning markets such as Egypt and Iran for Middle Eastern, Indian and Iranian style flat breads
	South Australia				
	Western Australia				
ASWN Australian Standard Wheat Noodle	Western Australia		10.50%	Japan/Korea	Developed for use in. noodle manufacture Outside of this use, wheat is too soft so loses value, but can be s blended into cargoeto the Middle East
ADR Australian Durum Wheat	QLD	<5%	Min. 13%	Italy, Morocco and Algeria	Pasta
	northern NSW		11.5%		
	South Australia		and 10%		

As noted above, grain classification is a combination of variety by zone or growing region. An indication of main wheat growing regions by general classification is depicted in the map opposite (Queensland Department of Primary Industries and Fisheries, 2009).

Australian wheat growing regions



## WHEAT TRADING STANDARDS

Since 2006 Grain Trade Australia (GTA) has on an annual basis reviewed, produced and published the Wheat Trading Standards (Grain Trade Australia, 2014) on behalf of the industry. The standards are developed by the GTA Grain Standards Committee.

The Standards provide a comprehensive list of definitions and grades (Variety Master List – more detailed than above), test methods and procedures and the specifications for each wheat grade. An example GTA specification (not all components of the specification) for one grade of wheat (APH1) is provided below.

Commodity: Wheat		Season: 2014/15	
Grade: APH1		Standard Reference No.: CSG-110	
QUALITY PARAMETER	SPECIFICATION	COMMENT	
Variety Restrictions	Yes	Approved varieties only	
Protein Min (%)	14.0	N X 5.7 @ 11% Moisture Basis	
Protein Max (%)	n/a		
Moisture Max (%)	12.5		
Test Weight Min (kg/hl)	76.0		
Unmillable Material Above the Screen Max (% by weight)	0.6	Includes whiteheads (with grains removed), chaff, backbone, Wild Radish pods, Milk Thistle pods or other seedpods not otherwise listed. Excludes contaminants where tolerances already exist	
Screenings Max (% by weight)	5.0	All matter passing through a 2.0mm slotted screen – 40 shakes in the direction of the slots	
Falling Number Min (sec)	350	Falling Number result overrides the visual assessment for Sprouted grains	
Defective Grains Max – (% by count, 300 grain sample [500 grain sample for WA], unless otherwise stated)			
Sprouted	Nil	Frost Damaged	1.0
Stained, including Staining due to Moist Plant Material, of which;	5.0	Heat Damaged, Bin Burnt, Storage Mould (count per half litre)	1.0
– Pink Stained	2.0	All Smuts except Loose Smut (entire load)	Nil
– White Grain Disorder / Head Scab / Flaked Grain	1.0	Takeall Affected	1.0
Field Fungi (count per half litre)	10.0	Insect Damaged	1.0
Dry Green or Sappy	1.0	Over-Dried Damaged	Nil

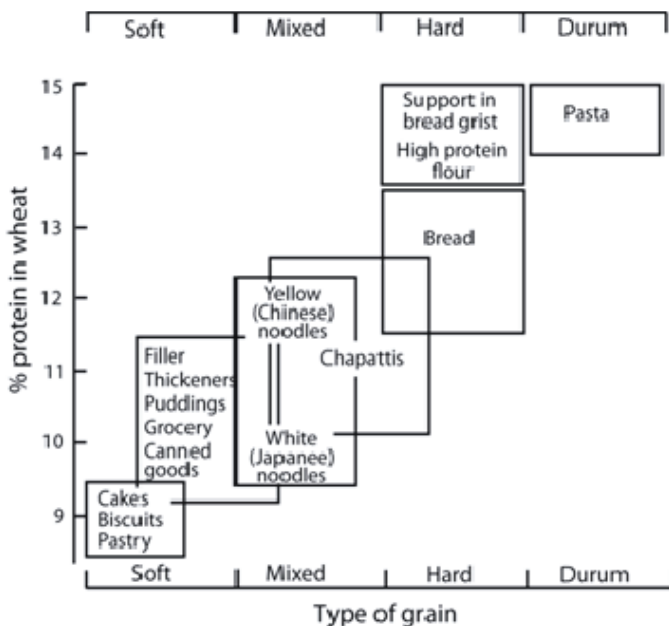


# PRODUCTS

Wheat is milled into flour and other products and these are used to make many types of food. For example, Manildra mills, which is the biggest player in the Australian wheat flour market with approximately 35 per cent market share, packs forty-two different products. These products are being sold to bakeries large and small Australia wide as well as exported

The balance between protein content, wheat hardness and the end product that the wheat may be used for is shown in the figure below (Queensland Department of Primary Industries and Fisheries, 2009).

**Figure 1: Balance between protein content, hardness and end product requirements**



Just a sample of some of the products made from wheat (of differing qualities) is provided below:

- **Bread** – one of the oldest and most diverse foods. Wheat (and to a lesser extent rye) is the only grain that can produce dough capable of holding gases produced by yeast well enough to give well-risen loaves. This property is related to the presence of gluten.
- **Biscuits, cakes and pastry** – doughs made for biscuits must be capable of being sheeted prior to cutting. Low protein, soft wheat is used for cake flour.
- **Middle Eastern Flat or Pocket Breads** – these products come in many shapes and sizes and are baked in very hot ovens for short times.
- **Pasta** – is made from semolina (high protein flour) from durum wheat. The dough is extruded through a die.
- **Noodles** – are produced by cutting strips from rolled sheets of dough. They can be boiled, steamed, dried or fried.
- **Gluten** (protein) and **starch** (carbohydrate) – are the two main 'by-products' of flour:
  - o Gluten is used to help natural gluten in flour to make better breads and buns. It is also used in pet food, small goods, glues and other chemicals.
  - o Starch has many uses. These include glues, fillers, confectionary, soft drinks, cordials, food thickeners, paper making, textile sizing, mineral flocculation. Other by-products include glucose and bran.

# REFERENCES

- Anon (nd, a) Australian Wheat Board. Australian Wheat.  
<http://www.awb.com.au/customers/australianwheat>  
(accessed on 11/6/2016)
- Anon (nd, b) Wheat Quality Australia.  
<http://wheatquality.com.au>
- Anon (nd, c) FINAL 2014/15 WQA Wheat Variety Master List. <https://www.graintrade.org.au/sites/default/files/file/Commodity%20Standards/WQA%20Wheat%20Variety%20Master%20List.pdf>  
(accessed on 11/6/2016)
- Grain Trade Australia (2014). Section 2 – Wheat Trading Standards, 2014/15 Season.
- Queensland Department of Primary Industries and Fisheries (2009). Wheat quality and markets in Queensland.
- Wheat Quality Australia (2013), Wheat Classification Guidelines.

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