

# SOUTHERN AUSTRALIA FOCUS

COVERING CROPPING SYSTEMS OF SOUTHERN NSW, VICTORIA, TASMANIA,  
SOUTH AUSTRALIA & WESTERN AUSTRALIA

*Observational studies from around the world have found strong links between the consumption of wholegrains, lower body mass index (BMI) and lower rates of obesity.*

## Cereal grains and weight management

### THE RESEARCH VIEW

**T**he Iowa Women's Health Study of almost 35,000 women found higher wholegrain intake to be associated with a lower body mass index (BMI) and lower waist-to-hip ratio.

The US Health Professionals study, involving over 27,000 men, found that for every 40 grams per day increase in wholegrain intake, weight gain was reduced by 0.49 kg.

The same relationship was seen in the six-year follow-up of more than 6000 men in the Multiple Risk Factor Intervention Trial. The men who ate the most breads and cereals achieved the greatest weight loss.

The European Prospective Investigation of Cancer (EPIC) study, which included over 11,000 women, showed higher cereal consumption (pasta, breakfast cereal and rice) predicted larger weight loss, but breads and legumes were not related to weight change.

The Malmö Diet and Cancer Cohort study of about 5000 adults found that

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### Consultants' Corner



Consultants' Corner is a new initiative by *Australian Grain*. This series of articles will highlight current GRDC-funded research with a particular focus on the commercial implications of adopting cutting-edge research.



Greater consumption of cereals and wholegrains is an important weapon in the worldwide fight against obesity.  
(Photo Peggy Greb)

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**<i...GRAINS AND WEIGHT CONTROL**

people who ate plentiful fibre-rich bread were least likely to experience obesity around the middle (that is, waist circumference above 94 cm in men and 80 cm in women).

The UK Women's Cohort Study involving around 34,000 adults found women who ate higher amounts of bran, wholemeal bread, legumes, cereals, pasta and rice had a significantly lower average BMI, as well as the lowest rates of obesity.

The Isle of Ely study (a UK study) involving more than 800 adults found people with high intakes of rice, pasta and legumes had a lower waist-to-hip ratio.

An Australian survey of eight year-old

children revealed that diets with more wholegrain cereals were associated with a lower BMI.

A Brazilian study of about 2500 adults linked traditional diets that rely mainly on rice and beans to lower risk of overweight or obesity after adjustment for dieting, age, physical activity and energy expenditure.

The USDA Continuing Survey of Food Intakes by Individuals, involving more than 9000 adults, showed that people who ate wholegrain foods were less likely to be overweight. Only seven per cent of people eating at least three serves per day of wholegrain foods had a BMI above 25, compared to 69 per cent of non-consumers. The same result was found in a survey of 285 13-year-olds in Minnesota.

**THE ROLE OF BREAKFAST CEREALS**

A large study called the Physicians Health Study, involving around 18,000 men, investigated the relationship between obesity and eating breakfast cereal. They found men who ate the least amount of breakfast cereal were significantly heavier than those who ate the most.

After eight years, men with higher intakes of cereals, regardless of grain type, had a significantly lower weight gain, and after 13 years those who ate at least one serving of wholegrain cereal daily had a significantly lower weight gain than those who rarely or never ate wholegrain cereals.

The National Health and Nutrition Examination Survey (NHANES) involving

**THE COMMERCIAL VIEW**

Dr John de Majnik, Manager New Grain Products, Grains Research and Development Corporation

**The changing face of grains**

Grain market dynamics are changing both domestically and internationally. Grain growers are beginning to see the potential advantages of a broadening base of end users requiring a product with specific functionalities. Commodity markets are still a main stay, but niche opportunities, such as consumer health preferences in the food area, are becoming more common in both domestic and international markets. Consumer preference is driving many new marketing niches, and the GRDC is trying to position particular varieties towards these areas so that growers can potentially enjoy price premiums by responding to this consumer demand in their cropping and marketing system.

**Go Grains linking consumer requirements to grain production**

Health, and as a consequence, nutrition is a strong driver of these trends. *Go Grains* Health and Nutrition Ltd helps the industry capitalise on this trend by delivering information about grains and health across the grains industry value chain to promote consumption and potentially new grain products. *Go Grains* members include major grain food manufacturers, research organisations and the primary grain producers, represented by the GRDC and the Grains Growers Association.

Effective information flow is an essential component of value chain integration. *Go Grains* provides scientifically valid and independent data upon which marketers, processors and manufacturers can base commercial decisions to support the development of new markets and products for the Australian grains industry.

*Go Grains* can provide growers with a greater awareness of the value chain in which they operate, with a better understanding of how their grains are used, who buys them and why, and what consumers do with the products produced from their grain. This will help growers become active value chain participants rather than just producers of commodity inputs.



Dr John de Majnik.

*Go Grains* provides information and vital links with food manufacturers allowing the GRDC to better align projects targeting new grain food products to manufacturers, and consumer demands, that will take advantage of these healthy trends and potentially deliver greater profits through specific and novel grain varieties to grain growers. The link between the food companies and growers, through the GRDC, is also vital in resolving research issues.

*Go Grains* connects with government on an individual level and by participating in vital processes which influence the public health agenda. *Go Grains* is a voice for the grains industry on nutrition and health matters. *Go Grains* can also provide critical input to the farming and scientific support base for the development of new and improved grain varieties. Consumer health issues such

as obesity are critical to monitor. The GRDC can position new grain varieties that can take full benefit of that trend and deliver that benefit to growers – they fill a niche market and gain a profit benefit as a result.

**The obesity epidemic**

A new Access Economics report titled '*Growing economic cost of obesity in 2008*' showed that obesity is costing Australia \$58 billion a year, and that 3.71 million Australians are categorised as obese. This total cost includes \$8.3 billion in the financial aspect and \$49.9 billion in the value of lost well being through disability and premature death. In addition, there is a staggering 137 per cent increase since 2005 of the incidence of Type-2 diabetes generated directly from obesity.

Australians are faced with an obesity epidemic and the food sectors and commodity groups must stay abreast of the nutritional requirements of their product in order to match supply with demand. There is increasing evidence from scientific studies to show that regular consumption of wholegrain foods has a role to play in combating this trend. We must continue to develop grain varieties for the public good.

more than 4200 adults showed that people who ate ready-to-eat (RTE) breakfast cereal ate significantly less fat and more fibre than those who did not. Among the female 'RTE cereal eaters' surveyed, significantly fewer were overweight (BMI greater than 25), with higher cereal consumption being associated with a lower BMI.

The National Heart, Lung and Blood Institute Growth and Health Study of more than 2000 girls aged nine to 19 years reported that girls who ate breakfast cereal had a lower BMI and lower risk of being overweight, after adjusting for other foods consumed.

The same relationship was found in a survey of more than 600 American children aged six to 12 years. Only 16 per cent of seven to nine year olds who ate more than eight serves of cereal fortnightly were overweight, compared to 50 per cent of those who ate three serves or less.

### WHOLEGRAINS VERSUS REFINED GRAINS

Higher intakes of wholegrain cereals and legumes are consistently associated with a lower BMI, waist circumference and overweight. One large study showed a slightly higher waist-to-hip ratio (but not BMI), with a higher consumption of refined grain foods, but other studies have not supported this finding.

The weight changes, although statistically significant, appear to be relatively minor (less than 0.7 kg over a 12 year period).



The Nurses Health Study examined the relationship between grain consumption and the development of obesity in around 74,000 nurses over 10 years. This study found increased intakes of wholegrain were associated with less weight gain. An increase in refined grains was associated with slight weight gain (0.99 kg versus 1.65 kg).

The BLSA study followed approximately 450 people for seven years and found significantly greater annual increases in waist circumference (1.32 cm versus 0.43 cm), but not BMI, among people who ate more white bread (15.8 per cent total energy from white bread), compared to those who ate less white bread (3.2 per cent total energy from white bread). ■



## CROP DOCTOR SOUTH

With Peter Reading

### RESULTS FLOW FROM WATER WISDOM

Plant available water capacity (PAWC) is a measure of the amount of water held in the soil and available to a crop. Soils with a high PAWC often have greater yield potential.

By understanding PAWC, grain growers can also gauge how much stored soil water is available for production at the start of the season.

It can improve understanding of yield variability across a paddock, enabling growers to identify poor performing areas and subsurface constraints. Growers are then better placed to predict yield potential and assess fertiliser requirements.

PAWC is determined by the drained upper limit (DUL), or the amount of water a fully wet soil can hold after drainage has ceased, as well as crop lower limit (CLL), or the amount of water left after a crop has extracted all available water from the soil profile. Factors affecting CLL include soil type, acidity, salinity, compaction, drainage and root depth of the crop species planted.

Grains Research and Development Corporation (GRDC) supported research by Neal Dalgliesh and his team at CSIRO Sustainable Ecosystems across Australia resulted in the APSoil web-accessible database.

Dr Yvette Oliver said data from 100 WA cropping soil profiles is grouped by agricultural region (northern, central and south coast) and WA soil group.

The data can be accessed at two websites: [www.apsim.info/apsim/Products/Apsoil.asp](http://www.apsim.info/apsim/Products/Apsoil.asp) and [www.asris.csiro.au/index](http://www.asris.csiro.au/index)

Google Earth, accessed through the above sites, can also be used to view site locations and soil data can be downloaded for personal use.

According to Neal and Yvette, there is no substitute for growers measuring and understanding their own soil PAWCs.

### PAWC workshops

They recommend growers attend GRDC supported workshops to learn about PAWC and collect information on the full range of soils in the wheatbelt.

Workshops in WA can be organised for your grower group or region by contacting Yvette Oliver, Ph: 08 9333 6469.

She said the APSoil database can provide *Yield Prophet* users with estimated PAWC parameters for a soil type where no soil measurements exist.

Also, with knowledge of soil PAWC, a soil from the APSoil database and historical climate information, *Yield Prophet* can consider different scenarios. These include:

- PAWC's impact on yield potential over a range of seasons, using long term weather records;
- Impact of various seasonal finishes on yield; value of stored moisture on yield expectations;
- Effect of sowing date on yield, historically and as the season progresses; and,
- Potential benefits of in-crop nitrogen application based on known soil starting nitrogen and seasonal conditions to a certain date.

A free research report, 'Estimating Plant Available Water Capacity', will soon be available from Ground Cover Direct, Freephone 1800 11 00 44 or Email [ground-cover-direct@canprint.com.au](mailto:ground-cover-direct@canprint.com.au)

The Crop Doctor is GRDC Managing Director, Peter Reading, Tel 02 6166 4500

Further Information: Dr Yvette Oliver Ph: 08 9333 6469 or Neal Dalgliesh Ph: 07 4688 1376.