Native Grains from paddock to plate

Teachers workshop
Acknowledgement of Country

We acknowledge the tradition of custodianship and law of the Country on which the University of Sydney campuses stand. We pay our respects to those who have cared and continue to care for Country.
Agenda

– **Sharing knowledges** to combine native grains with best-practice commercial agricultural systems

– How to navigate some of the difficult questions students might ask (or really want to ask!)

– Where to find teaching resources on native grains

Class idea = An idea you could try with students
Native Grains from paddock to plate

Teachers workshop
How can we share ancient and modern grains knowledges?

We have to recreate the entire system from the field, to processing, to people, and how they interact back to the field.
Modern fruit supply chain

1. Grow
2. Harvest
3. Transport
4. Eat
Modern grains supply chain

- Grow
- Harvest
- Thresh
- Mill
- Create food
- Consumer
Historic grains supply chain

Eat together

Thresh and grind

Manage, cut and bundle

Eat together
Implications for combining knowledge

Draw the paddock-to-plate production chains

– Can we use water in threshing?
Food spoils over time

– Can we sell food that’s different each harvest?
Food needs to be safe and somewhat predictable
Growing native grain crops
Species from Gomeroi country

Native grass species:
– Astrebla spp. (Mitchell Grass)
– Dicanthium sericium (QLD Bluegrass)
– Themeda australis (Kangaroo Grass)
– Bracharia milliformis (Arm Grass)
– Dactyloctenium radulans (Button Grass)
– Anthosachne scabra (Wheat Grass)
– Panicum decompositum (Native Millet)
– Paspalidium jubiflorum/distans (Warrego Grass)
– Themeda avenacea (Tall oat grass)
– *Microlaena stipoides (Weeping grass)

Other grassland grains:
– Lomandra longifolia (Spiny Headed Mat Rush)
– Portulaca oleracea (Puslane)
– Acacia spp.
– Santalum acuminatum (Quandong)
– Atriplex nummularia (Old Man Saltbush)
– Brachychiton populneus (Kurrajong)
Mitchell grass ecosystem, May 2017
Mitchell grass ecosystem, May 2020
One or many species?

- Agronomic considerations
  - Weed control
  - Plant competition
  - Harvest timing
  - Harvest difficulty
  - Post-harvest grain separation
Fire vs grazing?

- How to incorporate regenerative agriculture principles:
  - Change in species mix, fauna
  - Carbon credit implications?
  - Livestock provides additional income
  - Livestock requires additional skills + resources
Post-harvest processing
Threshing and grass seed morphology

Steps to handthresh native grass

Step 1- Get a wood threshing board. Put about a handful of grain. Spread it out, make sure there is no sticks or cathead or other junk that could give you a pinch.
Step 2- Find a flat piece of wood or a float.
Put a piece of rubber under the float; tape the rubber to the float.
Move the float back and forwards with some force for about 3 to 4 mins
Sometimes this method doesn’t work with some grains
Step 3 – Put all the grain in the corner of the box then put the sieve on top of a bucket to catch the seed. Lift the box, pour it onto the sieve then shake the sieve back and forwards for about a min or two then hopefully you have seed. If not repeat step 1 and 2 again.
Step 4 - final step
Once sieving is finished put the grain that is in bucket in the pestle.
Pick out the big pieces of trash then gently blow.
All should be left in the pestle is seed.
Threshing and grass seed morphology

What machines can separate grain?
Nutritional testing
Seed anatomy

Seed coat

Endosperm

Germ
Processing to flour

Grinding = creating wholemeal flour using all parts together

Milling = creating white flour by separating coat/germ from endosperm
Ground (wholemeal) flour

Kangaroo grass (*Themeda triandra*)
Milled (white) flour

Wheat  

Panicum decompositum  
(Quirindi)  
(Werris Creek)
Nutrition in the coat and germ

– Whole grains are healthier than refined flour
– [Refined flour has dough, texture and shelflife benefits]
How nutritious is whole vs refined flour?
How nutritious are native grains?

<table>
<thead>
<tr>
<th>NUTRITION INFORMATION</th>
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<tbody>
<tr>
<td>SERVING PER PACKAGE: 2</td>
</tr>
<tr>
<td>SERVING SIZE: 340g</td>
</tr>
<tr>
<td>AVERAGE QUANTITY</td>
</tr>
<tr>
<td>PER SERVING</td>
</tr>
<tr>
<td>AVERAGE QUANTITY</td>
</tr>
<tr>
<td>QUANTITY PER 100g</td>
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</tbody>
</table>

ENERGY
PROTEIN
FAT, TOTAL
- SATURATED
CARBOHYDRATE
- SUGARS
SODIUM

**Ingredients:** Mitchell grass flour

[Image of Made in Australia from 100% Australian Ingredients logo]
Native millet

*Panicum decompositum*

<table>
<thead>
<tr>
<th>Compound</th>
<th>Amount (per 100 g)</th>
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<tbody>
<tr>
<td>Carbohydrate</td>
<td>63 g</td>
</tr>
<tr>
<td>Protein</td>
<td>12.9 – 14.1 g</td>
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<tr>
<td>Fat</td>
<td>5.6 g</td>
</tr>
<tr>
<td>Saturated</td>
<td>1.1 g</td>
</tr>
<tr>
<td>Unsaturated</td>
<td>4.5 g</td>
</tr>
<tr>
<td>Ash</td>
<td>7.1 g</td>
</tr>
<tr>
<td>Energy</td>
<td>1678 kJ</td>
</tr>
</tbody>
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Image credit: PlantNET


Credit: Dr Claudia Keitel
### Kangaroo grass

*Themeda australis*

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**Image credit:** PlantNET  

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<tr>
<th>Compound</th>
<th>Amount (per 100 g)</th>
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<tbody>
<tr>
<td>Carbohydrate</td>
<td>52 g</td>
</tr>
<tr>
<td>Protein</td>
<td>17.6 – 19.3 g</td>
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<tr>
<td>Fat</td>
<td>8.9 g</td>
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<tr>
<td>Saturated</td>
<td>1 g</td>
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<tr>
<td>Unsaturated</td>
<td>7.9 g</td>
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<tr>
<td>Ash</td>
<td>9.6 g</td>
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<tr>
<td>Energy</td>
<td>1819 kJ</td>
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</tbody>
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Credit: Dr Claudia Keitel

The University of Sydney
Cultural and environmental context
Cooking up native grains and grasses

Indigenous women from Narrabri and Menindee have been involved in a project to cook traditional grains and grasses, which are an important part of the diet in many parts of Australia. The project is supported by the NSW Department of Primary Industries through the NSW Pioneer Project.

The women have been cooking and preserving native grains and grasses, which are high in minerals and vitamins, and have a distinct flavor. They have been using traditional cooking methods, such as roasting and boiling, to prepare the grains and grasses for consumption.

The women have also been experimenting with new recipes and ways of preparing the grains and grasses, such as using them in salads, stews, and soups.

Opportunities in commercialising native grasses

The project has potential for commercialisation, with the possibility of establishing a market for native grains and grasses. The women are exploring the possibility of setting up a business to sell their products, which could be a valuable source of income for Indigenous communities.

The project is being supported by the NSW Department of Primary Industries through the NSW Pioneer Project.

The women are also exploring the possibility of establishing a website to sell their products online, which could help to reach a wider audience.

The project is being supported by the NSW Department of Primary Industries through the NSW Pioneer Project.
Co-teaching

- Inter-discipline teaching

- Aboriginal teacher or liaison officer (or an appropriate local Aboriginal community member) share on cultural values

- Ag or science class grows, threshes or grinds the grains

- Food tech class cooks the flour
Resources and short videos


Scroll down to ‘Resources for industry and education’