CBWA – a private-public investment model for Australian plant breeding

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Associate Professor in Plant Breeding, UWA

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Plant Production Systems Workshop
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CBWA Objectives

• operate commercially and competitively
• achieve break-even by 2010-11
• add value to the production chain
  – produce the varieties of choice for growers in WA, national, and some international markets
• build local expertise
  – at the leading edge of worldwide technological and commercial developments
  – associated with an internationally competitive university in the plant sciences
CBWA Investors

- COGGO
  - Council of Grain Grower Organisations Ltd
- EGC
  - Export Grains Centre Ltd (GRDC from 1 July 07)
- UWA
  - Shareholding derived from infrastructure charge
- NPZ
  - Norddeutsche Pflanzenzucht Hans-Georg Lembke KG
  - interested in CBWA as a commercial vehicle for NPZ technology in Australia; long-term investors
Why CBWA?

• **Importance to Australian canola growers**
  – co-owned by growers
  – focus on outcomes for growers
  – focus on low rainfall conditions
  – more competition = more choice
  – access to international technologies (NPZ)
  – breaking new ground in breeding and marketing
  – training next generation of plant breeders
Why CBWA?

• Importance to The University of Western Australia
  – international, national and local linkages
  – cofunding of research positions by EGC~GRDC
    • Associate Professor in Plant Breeding (30%)
    • Research Fellow in Molecular Genetics (50%)
  – expand research and teaching base in plant breeding
    • PhD students, research grants, publications
    • undergraduate teaching
  – complementary to expertise in quantitative, population, molecular, evolutionary genetics
  – publicity and promotion to industry
    • excellence in research and training
CBWA Survival

• What does CBWA need to survive?
  – 20% of Australian canola market by 2011
  – integrated business from glasshouse to grower
  – continuous investment in R&D
  – at least one new variety per year
  – the “edge” on its competitors
    • technical edge
    • commercial edge
    • marketing edge
**Rapid breeding**

Varieties listed on PBR database in 2004-2005:

<table>
<thead>
<tr>
<th>Breeder</th>
<th>No. varieties</th>
<th>Year of cross (average)</th>
<th>Years to release (average)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag-Seeds, DPI Vic, DPI NSW</td>
<td>9</td>
<td>1996</td>
<td>8.4</td>
</tr>
<tr>
<td>CBWA</td>
<td>5</td>
<td>2000</td>
<td>4.4</td>
</tr>
</tbody>
</table>
CBWA’s Technical Edge

Innovation based on research at UWA
Introgressive crossing program from research visitor to UWA
Challenging research environment; stimulates change

CBWA Introgressive Crossing Programme
(following Recurrent Introgression for Population Enrichment (RIPE), D Falk, Univ. Guelph)

- Field Testing
- DH
- High (H)
  - Green = 87.5% E
- Medium (M)
  - Blue = 75% E
- Base (B)
  - Yellow = 50% E
- Elite Population
- High x Elite
- Elite x Elite
- Introductions (I)
  - White
  - e.g. Europe, wide crosses

Fig. 2
CBWA’s Technical Edge

Rapid breeding and efficient testing

Doubled haploidy

Reliable blackleg disease nursery

Molecular markers

Pure seed production CHILE 2007

NPZ connection
## CBWA’s Commercial Edge

Variety pipeline – superior varieties, every year

<table>
<thead>
<tr>
<th>Variety</th>
<th>Release year</th>
<th>Target envt</th>
<th>Special attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB™ Trigold&lt;sup&gt;®&lt;/sup&gt;</td>
<td>2004</td>
<td>LR</td>
<td>high oil, yield</td>
</tr>
<tr>
<td>CB™ Tribune&lt;sup&gt;®&lt;/sup&gt;</td>
<td>2004</td>
<td>MR-HR</td>
<td>high yield</td>
</tr>
<tr>
<td>CB™ Boomer&lt;sup&gt;®&lt;/sup&gt;</td>
<td>2005</td>
<td>LR-MR</td>
<td>large seeds</td>
</tr>
<tr>
<td>CB™ Tanami&lt;sup&gt;®&lt;/sup&gt;</td>
<td>2006</td>
<td>LR-MR</td>
<td>top yield 2006</td>
</tr>
<tr>
<td>CB™ Argyle&lt;sup&gt;®&lt;/sup&gt;</td>
<td>2007-8</td>
<td>HR</td>
<td>high oil, yield</td>
</tr>
<tr>
<td>TRIUMPH™ hybrid</td>
<td>2008-9</td>
<td>HR</td>
<td>high yield</td>
</tr>
<tr>
<td>Replace Tanami&lt;sup&gt;®&lt;/sup&gt;</td>
<td>2009</td>
<td>LR</td>
<td>higher oil, yield</td>
</tr>
</tbody>
</table>
Superior yield in target markets

Australia Wide 2006 low rainfall NVT sites – 14 locations
CBWA’s Marketing Edge

Technical marketing, customer focus

Working with retailers, WA 2006

CBWA grower field day, WA 2006

Mailout to customers, Dec 2006 - together with EPR Declaration

Customer-friendly website

Demo site Coorow WA 2006
CBWA’s “Secret Edge”
The CBWA Team @ UWA
CBWA’s “Secret Edge”

Team motivation @ UWA

- CBWA shareholders have similar values to team members (not just a business)
- pay and conditions follow university regulations
- no royalty to team members from seed sales/EPRs
- no payments to Board Directors (including Research Director!!)
- “flat structure” promotes input from all team members
- team members own and value the outcome
- efficiency and savings count towards future survival
- recognition at home and abroad (NPZ)
- working at the technical and commercial cutting edge of the profession
CBWA’s Business Plan Phase 2

CBWA Costs
- Commerc/Marketing
- Seed Production
- Corporate
- Research & Develt

CBWA Income
- Other
- End Point Royalty
- Seed Sales/ Royalty
### CBWA Market Share

<table>
<thead>
<tr>
<th></th>
<th>High rainfall (&gt;400 mm)</th>
<th>Low rainfall (&lt;400 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WA</strong></td>
<td>100,000 ha (25%)</td>
<td>80,000 ha (80%)</td>
</tr>
<tr>
<td><strong>Eastern Australia</strong></td>
<td>Competitors’ market 30,000 ha (3%)</td>
<td>10,000 ha (10%)</td>
</tr>
</tbody>
</table>

2010/11 area sown to CBWA varieties = 220,000 ha (14-20% Australian market)
CBWA off-balance sheet benefits to shareholders

• Avoiding market failure
  – COGGO, EGC(GRDC)

• More choice, more competition
  – COGGO, UWA, EGC(GRDC)

• Capacity building for future plant breeding
  – UWA, EGC(GRDC)

• Access to international technology
  – NPZ and Australian shareholders
EGC~GRDC investment at UWA

• 1999 – 2001
  – “Associate Professor in Plant Breeding”, GRDC initiative
  – Wallace Cowling employed Feb. 1999

• 2001 – 2007
  – EGC-funded research contracts for W Cowling (30%) and M Nelson (50%) (cost ~ $100K/year)
  – 5 PhD graduates
  – $2.7M external competitive grants in breeding methodology, molecular genetics and national germplasm improvement
  – >14 research papers international journals
  – Brassicas, lupins, pea
Dr Cameron Beeck
PhD UWA 2002-2006
Supervisors: W Cowling & Janet Wroth
GRDC Project UWA356:
“Rapid recurrent selection to improve resistance to black spot in peas”

Dr Beeck was the 2006 Grains Research and Development Corporation Winner of the "Australian Government's Science and Innovation Awards for Young People in Agriculture, Fisheries and Forestry"
The future for CBWA and its shareholders

• CBWA shareholders are “patient” investors
• CBWA shareholders seek a range of benefits
• Off-balance sheet benefits have accrued since 2001
• Direct benefits (profits) will begin after 2011
• CBWA is an important model for public-private investment in plant breeding in Australia
• EGC~GRDC support of research and training in plant breeding at UWA is a key component of this model with exceptional outcomes for minimal investment
• Future??