Canola – break crop benefits & sowing hybrids

Better Break Crops adviser workshop
Perth, 9 October 2010.




GRDC Grains Research & Development Corporation

AOF

3. Sowing rates for hybrids

BETTER BREAK CROPS
Advancing Broadleaf Cropping.

GRDC
Grains Research & Development Corporation

AOF

3. Key messages

1. Uniformity more important than average plant density
2. Calculate sowing rate based on optimal plant density rather than a set rate
3. Hybrids possibly compensate better than OPs for low plant densities, but beware of going too low
4. Two kg/ha for non TT hybrids is often too low
5. A bag of non TT hybrid seed has 25-50% less seeds than an OP
6. Hybrids establish about 10% more plants than OPs
7. Hybrids are more likely to respond to high sowing rates depending on season. Use lower rates for low rainfall areas.
8. If dry sowing, consider using an OP variety
9. More data needed at low-moderate sowing rates.

3. Recommended plant density for OPs

- Suggested rates for open pollinated canola vary:

State	Rainfall zone	Rainfall (mm)	Plants/m^2
WA	(Growing Western Canola)		50-70
Vic	low-medium	250-500	30-50
Vic	high	500+	50-75
SA	low	250-350	40-70
SA	medium	350-500	50-80

Cutting rates for hybrids

- It appears hybrids may compensate better than OPs for lower density, but beware:
  - not to shave too much from hybrid rates.
  - Low hybrid rates don't leave much margin for error.
  - low rates are more risky when weeds and pests are not well controlled.
  - Wider rows can reduce establishment %
  - N with/near seed can reduce establishment % on wide rows

Company recommendations for hybrids

Pioneer Hi-Bred hybrids:

- Low rainfall: 1.5 - 2.5 kg/ha;
- Medium rainfall (400mm+): 2.0 – 3.0 kg/ha;
- High rainfall (600mm+): 2.5 – 3.5 kg/ha

Pacific Seeds hybrids:

- Low rainfall: 25-40 plants/m^2;
- Medium-high (400mm+): 40-60 plants/m^2.

3. Sowing rates of hybrids

- Uniformity of plants is most important
  - 2009 WA trials suggest hybrids:
    - seem to compensate better than OPs at low densities (e.g. 30 plants/m^2);
    - seem to respond to higher plant densities more than OPs.

3. Calculate sowing rates

- Sowing rates should be calculated based on target plant density, rather than a set rate.
  - See factsheet for calculation. Note:
  - hybrid seed can be up to double the size of OPs
  - hybrid establishment around 10%>OPs;
  - non TT hybrid establishment around 14%>OPs
- Required hybrid sowing rates can vary considerably mainly due to big variations in:
  1. likely establishment % (seed bed conditions)
  2. seed size between varieties and seed lots;

Calculate sowing rates

1. Establishment %: what number to use?

- OPs average 40-60% establishment
- Non-TT hybrids rule of thumb: 70% establishment
- can be up to 80-90% in ideal conditions
- can be 25-30% in dry conditions

Calculate sowing rates: Variation in seed size

Type	Variety	mg	Seeds per kg
Hybrids	Hyola502RR	6.5	155,000
	45Y82	6.1	164,000
	Hyola 50	6.1	165,000
	Hyola601RR	5.7	175,000
	Hyola571CL	5.3	190,000
	46Y20	4.9	203,000
	CB Tumby HT	3.8	263,000
Open pollinated varieties	ATR-Cobbler	3.6	275,000
	44C79	3.5	287,000
	AV-Garnet	3.3	300,000
	GT61	3.1	325,000

Non TT hybrid seed is larger: every bag can contain 25-50% less seeds than a bag of OP seed

Source: M. Seymour

3. Calculate sowing rates

Example: OP with 290,000 seeds/kg vs. hybrid with 175,000 seeds/kg

Sow rate Kg/ha	Type	Establishment %		
		40%	60%	80%
		Plants/m^2		
2	Hybrid	**14**	21	28
	OP	23	35	46
3	Hybrid	21	32	42
	OP	35	**52**	**70**
4	Hybrid	28	42	56
	OP	46	**70**	**93**

NB: hybrids establish at higher % than OPs

3. Sowing rates – example of cost

Plants/m²	OP	Hybrid
Cost	$11/kg	$25/kg
21	$11	$45 (1.8 kg/ha, 70% establishment)
42	$22	$90 (3.6 kg)
63	$33	$135 (5.4 kg)
84	$44	$180 (7.2 kg)

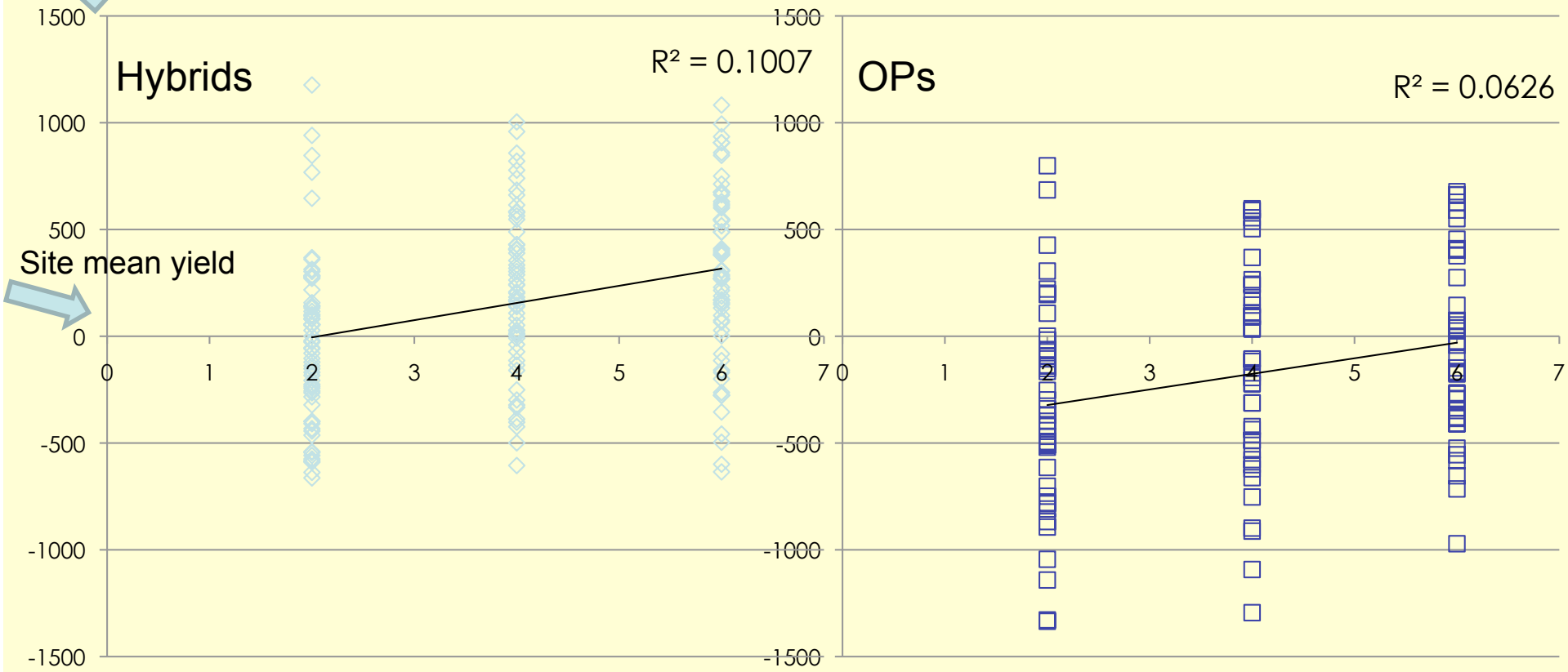
Source: M. Seymour, DAFWA

3. Sowing rates: effect on yield

- For every 1 kg/ha increase in sowing rate need extra 46-50 kg/ha yield to cover costs when canola at $500/t.

3. 2009 Pac seeds trials

Yield difference from site mean (kg/ha)



Site mean yield

Kg/ha

Sowing rate (kg/ha):
2, 4 and 6 kg/ha

Data source: Pacific Seeds.

Data source: Pacific Seeds.

3. 2009 Pac Seeds trials

Percentage of site x variety times each sowing rate yielded best in Pacific Seeds 2009 trials for the hybrids only

2009 growing season rainfall	NSD or 2 kg/ha best	4 kg/ha best	6 kg/ha best
High (370-440 GSR) & irrigated (7 sites)	34%	40%	26%*
Medium (300-350 mm GSR) (2 sites)	63%	31%	6%*
Low (236 mm GSR, dry finish) (1 site)	100%	0	0

The highest sowing rate was in three Victorian sites and one NSW site.
Glenorchy & Lake Bolac responded to high sowing rates.
In most of these cases, the high rates were profitable.

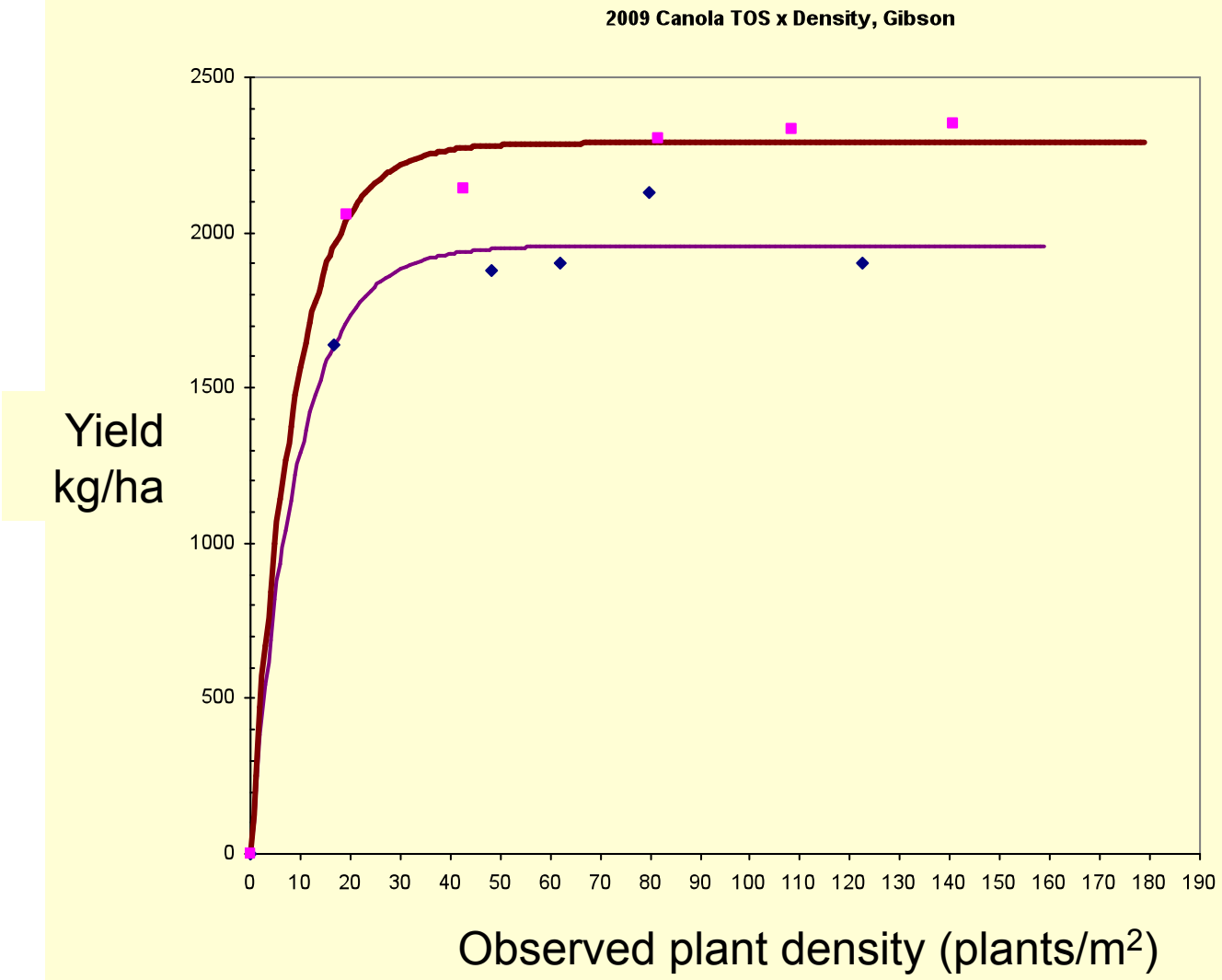
4. Sowing rates – Eastern state trials

– Trials in Vic, SA and NSW through Better Oilseeds and SFS found:

- In extreme dry years, lower plant densities (<30/m^2) can be beneficial.
- Hybrid yield in SA sites @ 25-30 plants/m^2 < 60 plants/m^2
- In very wet years, higher plant densities (100 plants) can sometimes increase yield in trials but generally not cost effective.

3. Sowing rates – DAFWA trials

- Law of diminishing returns.
- General trends:
  - Hybrids seem more tolerant than OPs of low plant densities
  - Hybrids seem more yield-responsive than OPs to high plant densities
  - Average13% higher establishment of Clearfield hybrid than OP.



Plant density v. yield of one hybrid and one OP canola Gibson, sown 19 May 2009.

Source: DAFWA.

4. Sowing rates for dry sowing

- If dry sowing, an OP would be less financially risky:
  - would need 4-5 kg/ha hybrid = $92-115/ha.
  - 4 kg/ha OP = $36/ha

Hybrid sowing rates

- More trials are underway…

Thanks

BETTER BREAK CROPS
Advancing Broadleaf Cropping.

GRDC
Grains Research & Development Corporation

AOF