



Novel Resources for Oilseed Rape Breeding: Improving Harvest Index

LK0964

NOVORB-HI



Elsoms



Partners of the Link project:

Industrial:

Breeding -

CPB Twyford
Elsoms Seeds
Monsanto
Nickerson
Saaten Union

Peter Werner
Mark Nightingale
Matthew Clarke
Jo Bowman
Richard Jennaway

Biotechnology – Biogemma

Jeroen Wilner

Levy board – HGCA

Graham Jellis

Academic:

JIC

Ian Bancroft, Colin Morgan,
Rachel Wells

Normal Oilseed Rape canopy



Some of the problems of canopy architecture

Indeterminate growth habit

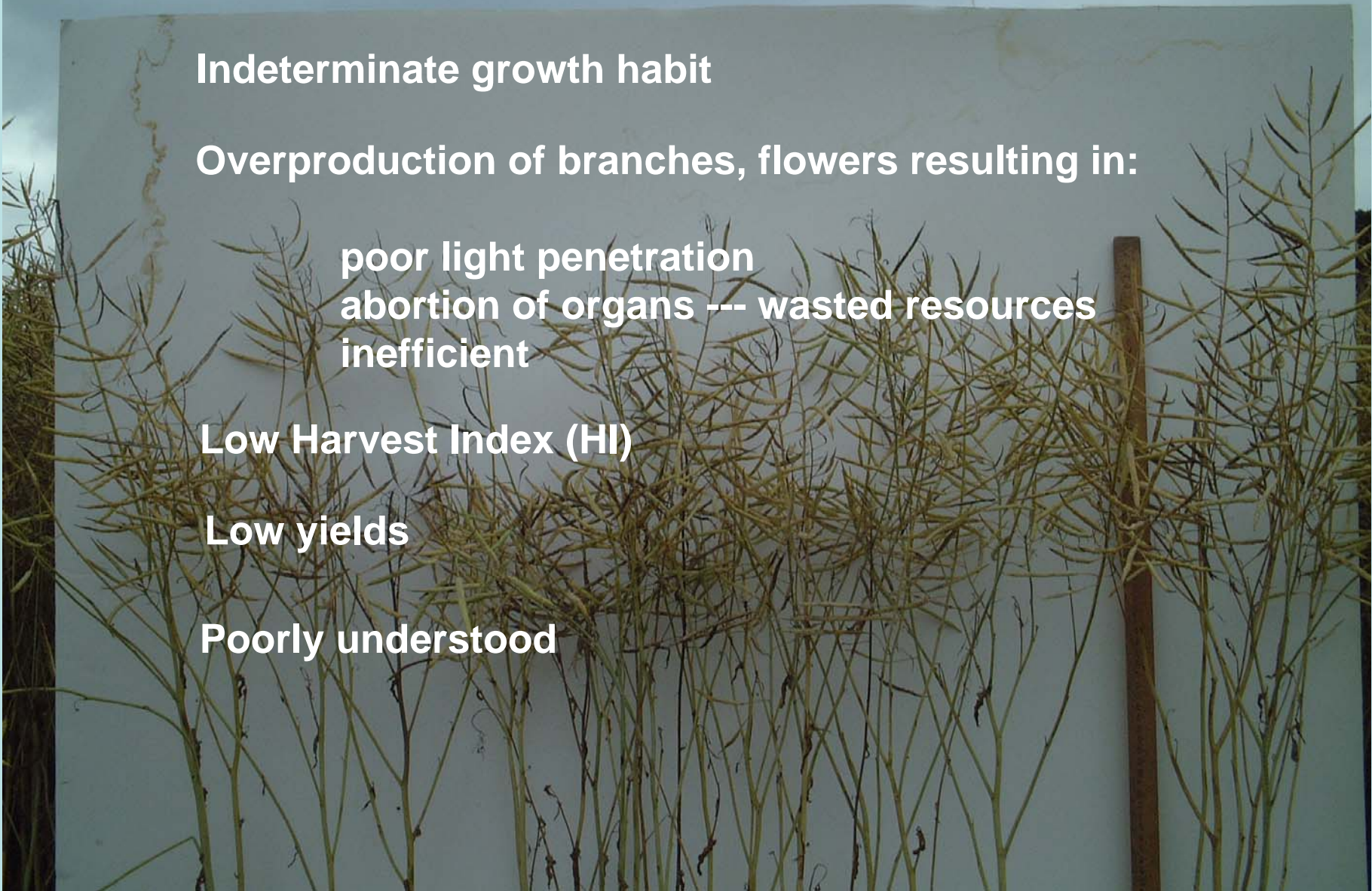
Overproduction of branches, flowers resulting in:

**poor light penetration
abortion of organs --- wasted resources
inefficient**

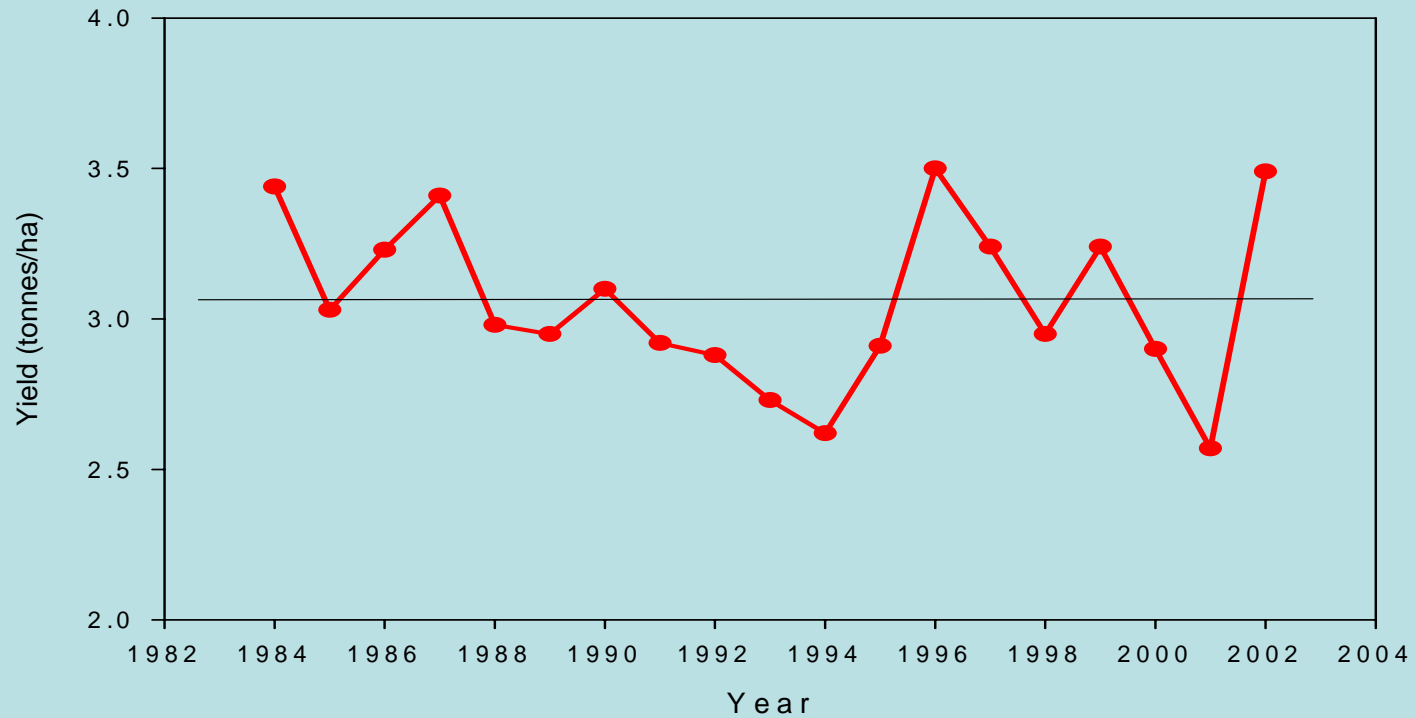
Low Harvest Index (HI)

Low yields

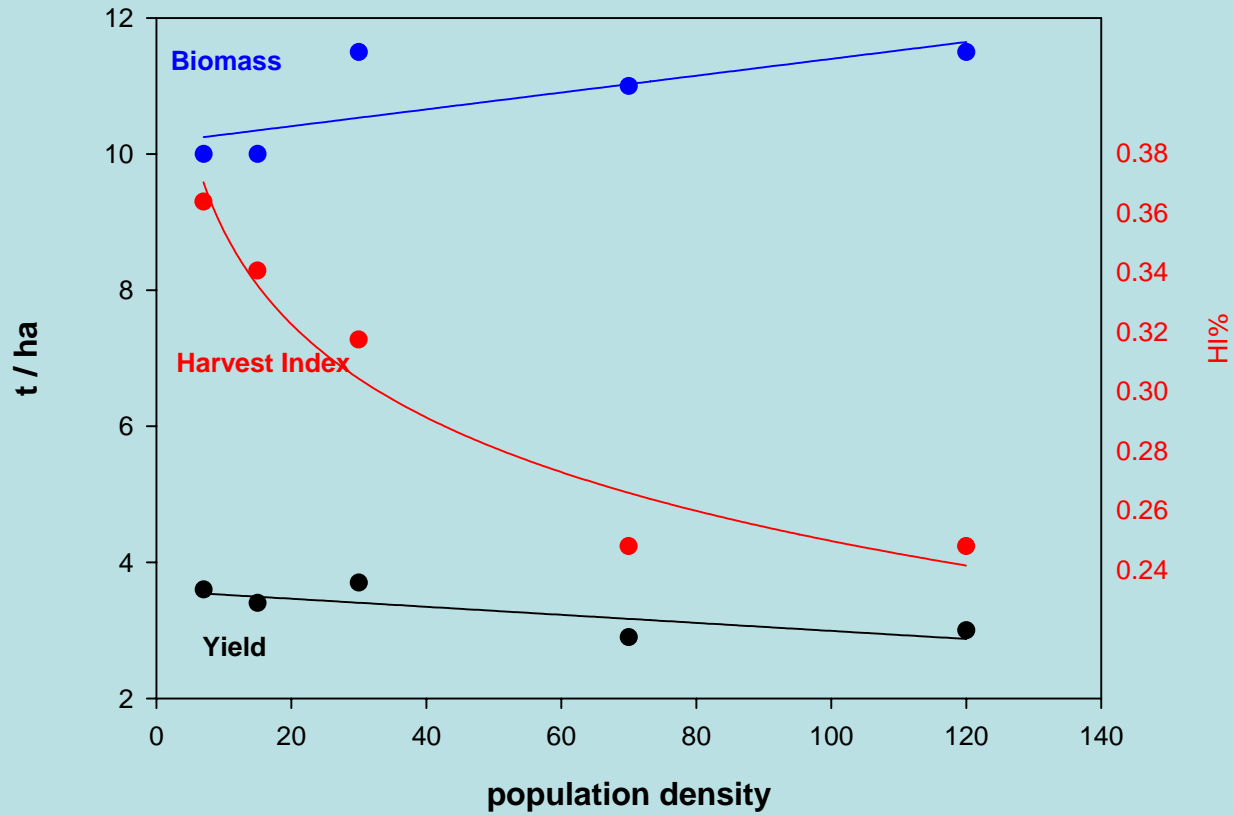
Poorly understood



Average yields of oilseed rape 1984 - 2002

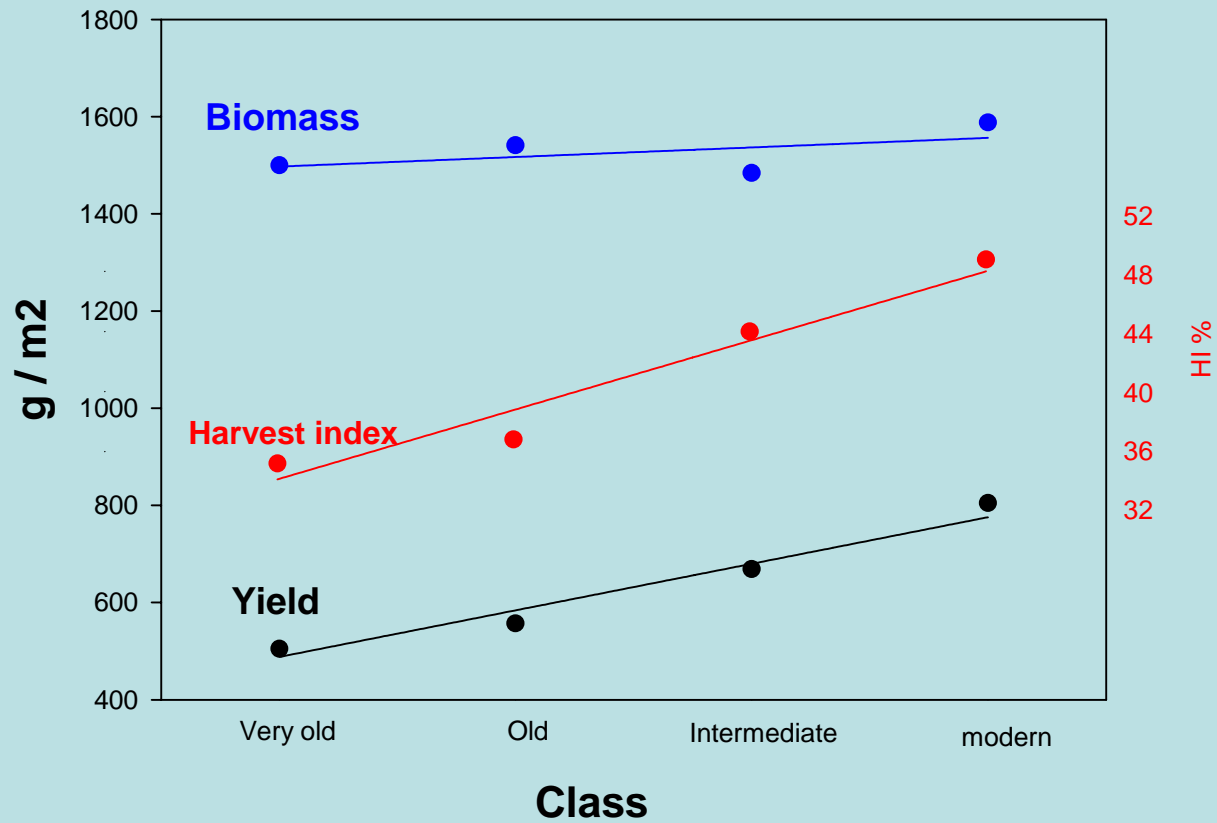


Effect of plant population density on yields and Harvest index



Lunn et al (2001) Canopy management in winter oilseed rape. HGCA rpt no OS49

Genetic improvement in Wheat



Austin *et al* (1989) Genetic improvement in the yield of winter wheat: a further evaluation. *J. ag. Sci* **112** 295-301

Why has little progress been made?

- **complex system --- many interactive traits**
- **genetically complex --- quantitative/polygenic**
- **strong Genotype x Environment effects**
- **limited variation**

BUT:

**Generate new variation suitable for genetic mapping
through doubled haploid production**

New information from model plant arabidopsis

Develop markers for traits in Brassica from model crop

What traits are of interest?

yield components

seed size & number
pod number
branch number
stem density

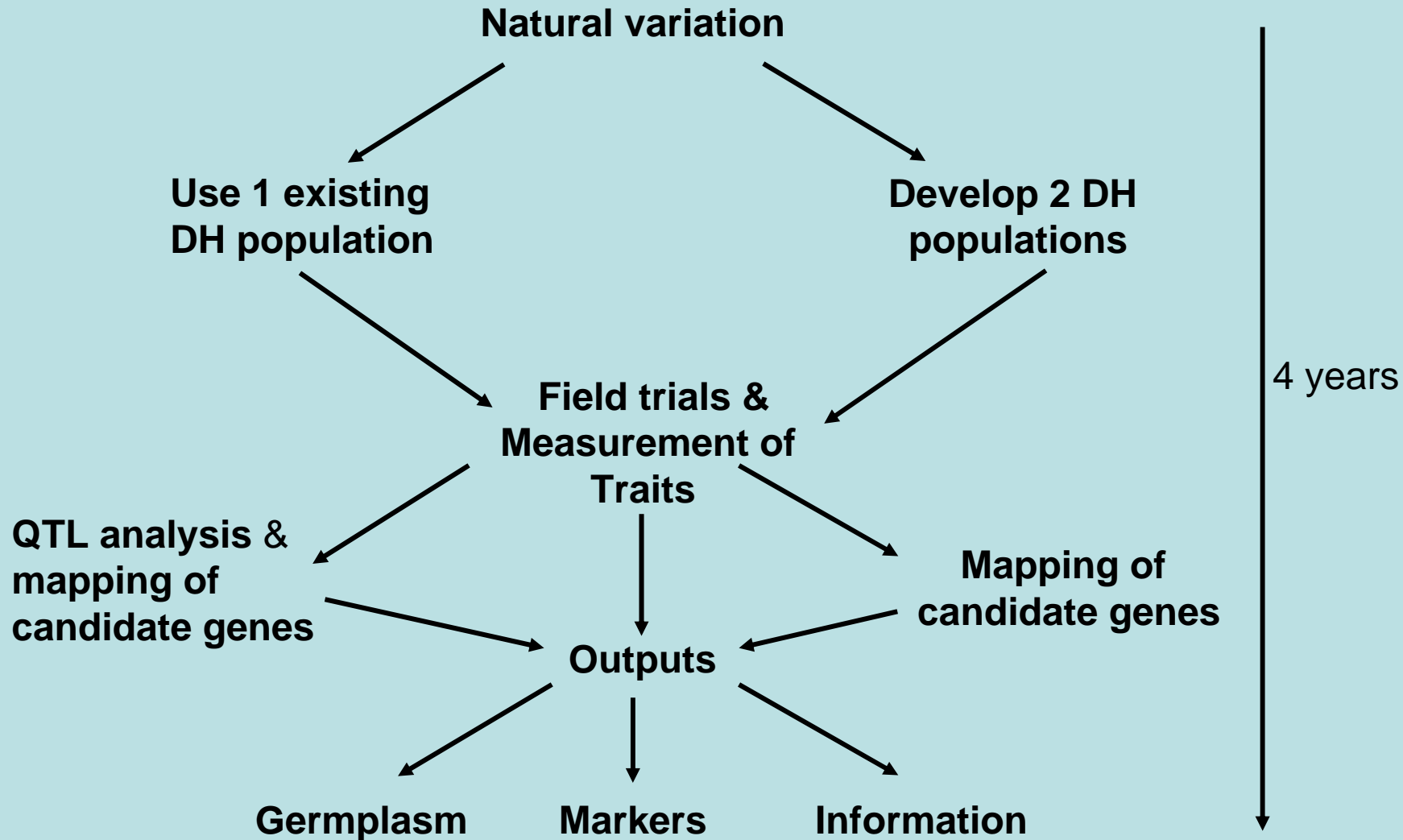
canopy efficiency traits

branch & pod angles
NUE
photosynthesis
drought

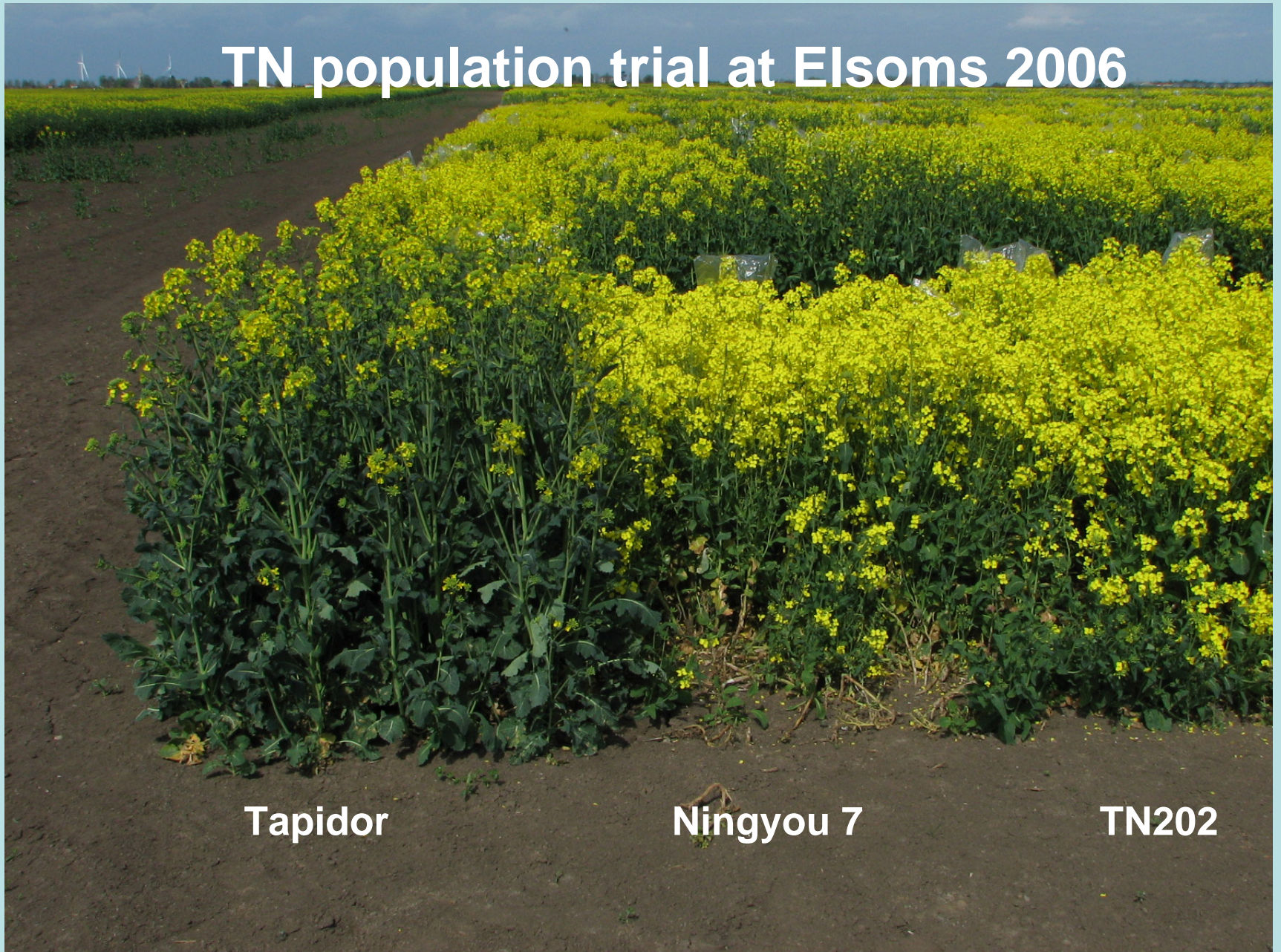
harvest index traits

seed & pod size
stem thickness
aborted pods & stems

Strategy & work plan for NOVORB-HI



TN population trial at Elsoms 2006

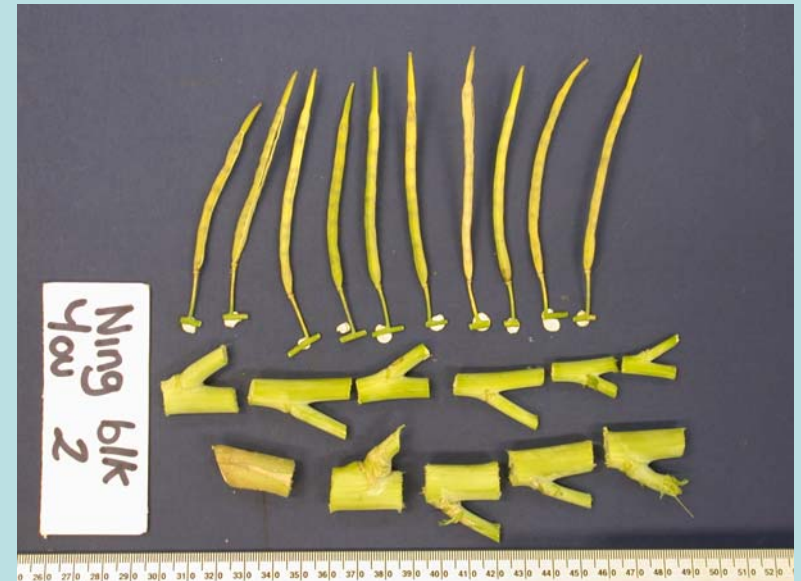


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TN202

Plant dissection for detailed trait analysis



Selected candidate genes associated with:

	<i>no. genes in arabidopsis</i>	<i>no. loci in brassica</i>
<i>Branching</i>	8	94
<i>Stature</i>	5	10

Markers are now in production for all 3 populations

