



New Developments in Beet Improvement

Yields, varieties, priming, pesticides, Gmo

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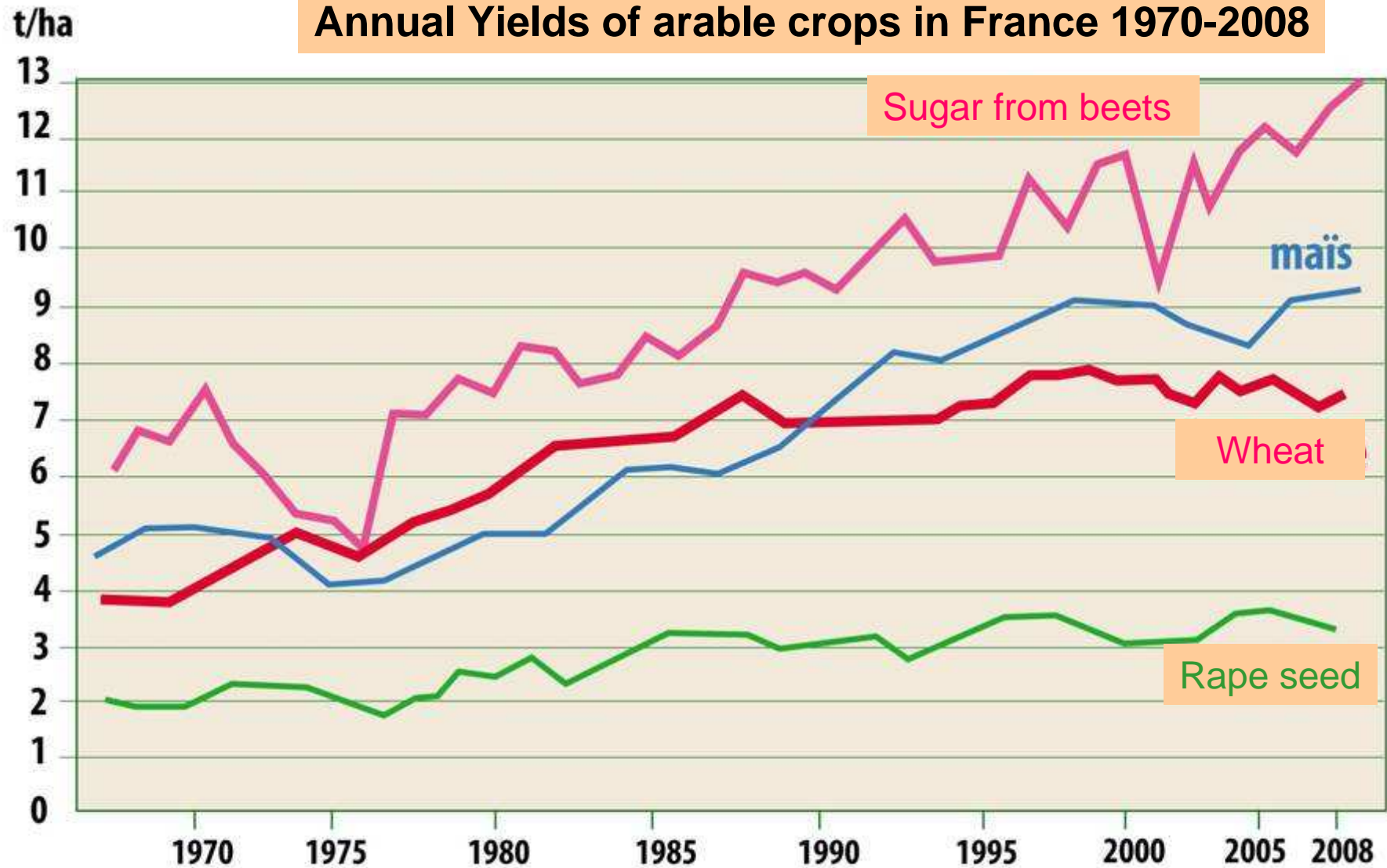
Institut Technique de la Betterave, France

CIBE XLII Congress

Copenhagen, 18 June 2009



Annual Yields of arable crops in France 1970-2008



Sources : Eurostat, calcul INRA, ITB



Rapid progress in genetics and varieties is needed and achieved

- life time of varieties is short: " rapid turnover"
- Varieties are changing to adapt to the climatic change:
 - Dry matter allocation to root more than to leaves ("harvest Index")
 - Higher resistance to diseases that are favored by climatic change: Rhizomania, Rhizoctonia, Nematodes, Cercospora
 - Rhizomania is changing also: more aggressive viruses need varieties that combines several sources of resistance
 - Tolerant varieties to nematodes need rapidly a higher resistance to rhizomania
 - Lot of work to be done between Institutes, research and breeders to develop durability



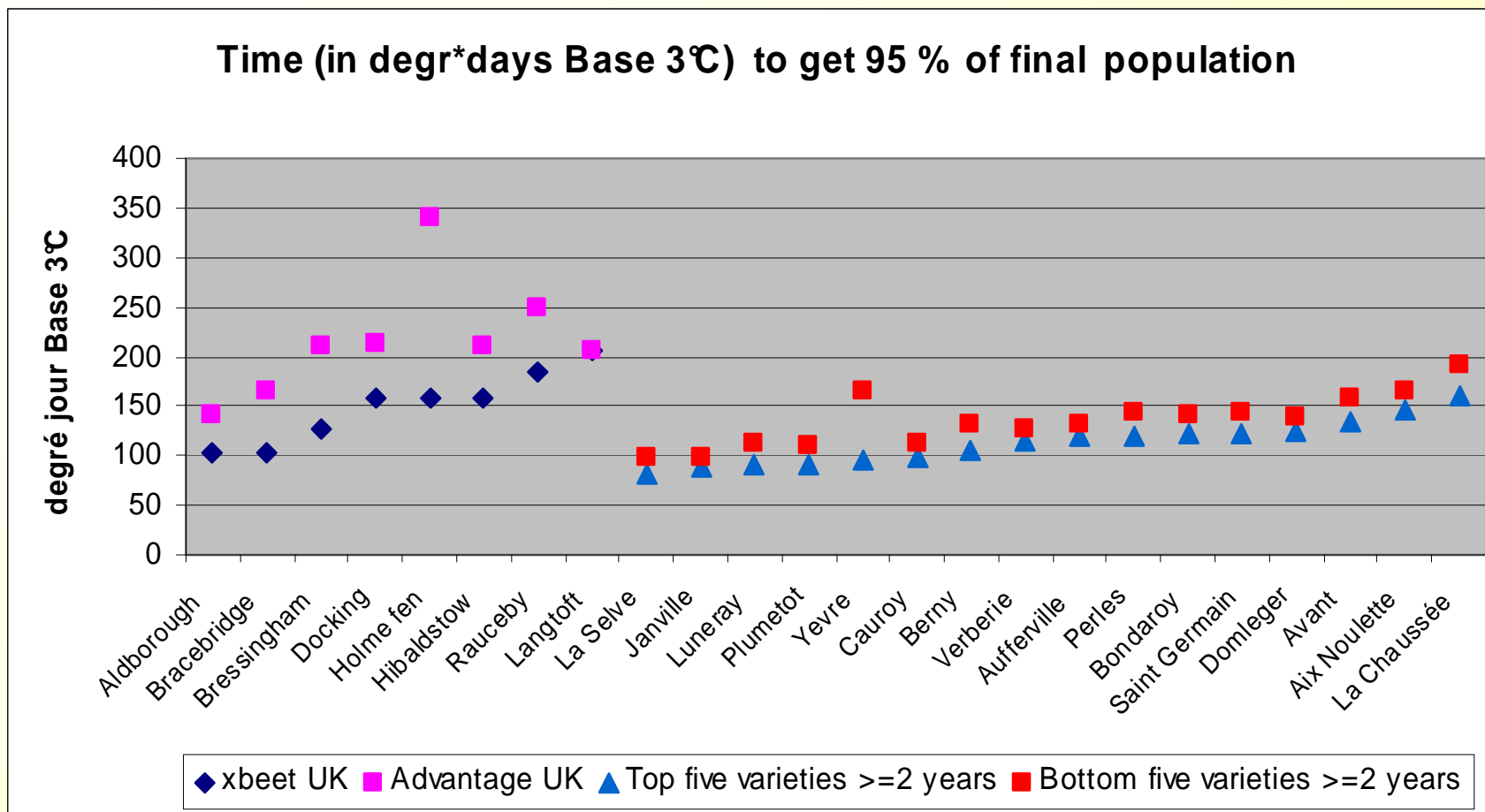
Improve Seed quality to help drilling earlier and get higher yields

From British Sugar Review, Winter issue, 2008

- Yield benefit to Advantage®: 4%
- Yield benefit to XBEET®: 3,3%
- Total due to “Priming” 7,3%



Seed Quality UK (2008) vs France (2009)



UK: Advantage, XBEET F: Start-Up, EPD, Energ'Hill, 3D+, Seed+



PPP regulation

- EU regulation not too severe before 2018
- Very few a.i. at risk at this level
- But some decisions can be rather restricting
 - Triflusaluron was at risk in december. CIBE and national lobbying helped to enlist it on "annex 1"
 - In France, renewal of authorization are already more restrictive
 - In terms of quantity of a.i. and/or in terms of number of sprayings e.g: ethofumesate...
 - Use of PPP should "if possible" be reduced by 50% in ten years (<2018)



PPP regulation

- How to implement such a reduction?

Use of herbicides is the most essential and critical especially for sugarbeet

- is there any possible future development for mechanical tools as it was very commonly used 30 years ago? It may cut use by 50%
- new kind of equipment are to be tested, as they are developing in organic cropping
 - Others aspects must be investigated like "management of "intercrop", or even more of cropping system with the aim of better weed management.



Dés herb'Avenir 2018





PPP regulation

- How to implement such a reduction? (cont.)

Reduction with fine tuning in use of fungicides?

IPM development

Improve resistance in the varieties against foliar diseases

(40% varieties with better resistance to CLS in one factory in France in 2009!).

manage the agronomic factors of diseases risk (crop rotation, fertilizers ...)



First year with Round-Up Ready beets in the US

- Adopted at 50% in 2008
- Excellent weed control: 85% vs 35% with conventional
- Better yields due to good weed control
- Adopted at 90% in 2009
- Less easy on 15% of acreage: some weeds more "resistant"; need for complementary molecules
- Need for a "specific" stewardship, in order to prevent problems
- Seed quality and Rhizomania resistance level not the best in first varieties



SugarBooster™ Technology

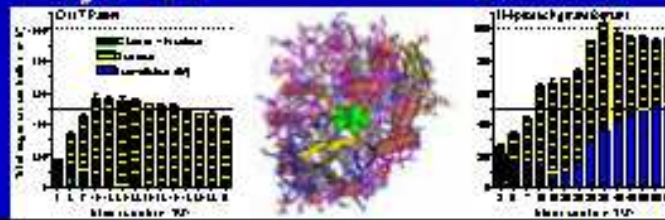
SI expression can increase total sugar content in plants

◆ Working to establish

- optimal implementation
- stability & efficacy in the field
- species & genotype specificity

◆ Potentials for enhanced:

- sugar accumulation
- consumer appeal
- consumer health
- food production
- biofuel production
- understanding of source-sink relationships



From Robert Birch,
University of Queensland
Plant Biotechnology Journal, 2007

SugarBooster Technology demonstrates that there are enormous potential progress