

# Whither 6-row barley

Triennial Barley Meeting

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# What is 6-row barley?

- Barley genotypes which have three fertile spikelets at each rachis node. There are two sides to the rachis thus there are two rows of three giving six rows.
- 2-rows have only one.
- There is no such thing as 4-row barley

# 6-row

- Central kernels are larger than laterals
- Thus more variability in size and on average smaller kernels

# Genetic control

- Controlled by a single recessive gene.
- Dominance varies with background
- A number of modifiers
- There is a complex of traits associated with this gene

# Breeding

- A separate breeding program is needed for 6 -rows
- It is necessary to build a different genetic and phenotypic architecture for 6-rows and 2-rows
- Crosses can be made and genes transferred but the different backgrounds must be recovered for a successful cultivar to be derived
- All of the same tools and analytical procedures are however applicable

# Comparison

| Trait        | 6-row  | 2-row  |
|--------------|--------|--------|
| Kernels/node | 3      | 1      |
| Leaves       | wide   | narrow |
| Stems        | thick  | thin   |
| Tillers      | few    | many   |
| Forage yield | higher | lower  |

# Comparison

| <b>Kernel size</b> | <b>smaller</b>                 | <b>larger</b>                   |
|--------------------|--------------------------------|---------------------------------|
| Kernel uniformity  | less                           | more                            |
| Plumpness          | lower                          | higher                          |
| Grain yield        | higher (high yield conditions) | higher (lower yield conditions) |

# Comparison

| Protein   | higher                         | lower  |
|-----------|--------------------------------|--------|
| Enzymes   | higher                         | lower  |
| Extract   | lower                          | higher |
| Taste     | more astringent<br>(drinkable) | less   |
| Sprouting | less                           | more   |
| Fusarium  | Very susceptible               | less   |



# Uses Food

- 2-row is dominant
- Larger more uniform kernels better for handling and processing
- Some specialty uses such as barley tea, prefer 6-row

# Uses Feed Grain

- 2-row preferred
- Larger more uniform kernels, handling and processing
- Lower hull percentage
- There is not much in it since price not quality is the driver. Six rows generally yield more in high productivity situations.

# Uses Forage

- 6-rows provide greater yields
- Some indication that 6-rows are less palatable due to their thicker stems
- More of a factor if cut for hay than for silage

# Uses Malting and Brewing

- North America is the only consistent major market
- Some European winter 6-row used for blending because it is cheap as a result of higher yields (subsidies?)

# Canadian Selected 5 yr Ave

|         | Domestic | Export  | Total     |
|---------|----------|---------|-----------|
| Tonnes  | 950,000  | 940,000 | 1,890,000 |
| % 6-row | 10       | 18      | 14        |
| % 2-row | 90       | 82      | 86        |

# Uses Brewing and Malting

- Major user in Canada is Labatt however due to population base only a small amount of 6-row used in Canada
- Majority of 6-row is exported to the USA as malt or barley, major users are Anheuser-Busch and Miller
- Some exports to Colombia

# Why is 6-row used

- Tradition
- Higher enzymes and protein suited to high adjunct brewing
- Taste factor. 6-rows have a slight astringency which is related to drinkability. Somewhat akin to adding a tiny amount of lemon or lime.

# Future Forage or Feed?

- No change in demand unless there are major changes in the livestock industry
- May change if breeding effort is reduced and improved varieties are not available



# Future M&B?

- Depends entirely on where AB and Miller go
- Budweiser used to be 80% 6-row in the malt blend. Considerably lower than that now. In some markets Bud is made from 100% 2-row
- Miller remains at a high level in their blends
- Accountants now running the show not craftsmen.
- Current indications are that the demand will be stable for the foreseeable future
- Support your local breeders

# Future

- Does well in certain areas. That niche will remain
- A range of quality profiles available in Canadian varieties
- Canadian varieties outperform USA varieties in Canadian production by a significant margin. Should be a Canadian breeding effort to give full benefit to Canadian farmers
- Varieties will have to perform well on both sides of the border, users are not prepared to use different varieties from each country
- Recent varieties are very exciting, CDC Clyde, CDC Kamsack, CDC Mayfair, SR 425
- Will Canadian breeding programs be economically justifiable if brewer demand falls? Not likely!