Basic Plant Breeding

Many Stages to a new variety

Stage One: Varietal Development: **7 to 10 years**

Part One: "**Best crosses**" for growing in Canada selected by researchers working with farmers/WGRF - *then move on to:*
Part Two: 8 or more **Segregating Generations** – *then less than 1 in 1,000 move onto*:

Part Three: Preregistration Trials Of Crosses / Breeders compare various lines

Concurrent work: Cooperative Pre Variety Registration Trials Of Crosses - 3 year process

Performance Evaluation and Selection

Early Generation Nurseries
Inoculation Of Diseases @ Nurseries
Winter Nurseries to grow extra seed
Preliminary Quality Evaluations
Multi-location Adaption Trials
Final Pre-Registration Co-ops

Pedigreed Seed Production

Starts at same time as final preregistration coops
Year One: 200 single heads collected for first year entry
Year Two: 2 meter long head rows grown by breeder – atypicals discarded
Year Three: Seed Increase Unit produces initial Breeder Seed for pedigreed multiplication (final "C" level, cooperative trial)

-Typically the *Seed Increase Unit* **(Indian Head Research Stn)** plants 150-200 single plant progeny lines as single 15 meter rows per line. This is a costly, labour intensive process as each line is individually planted, labelled, inspected for uniformity, trueness to type and disease reaction and sub-sampled. Atypical or non-uniform lines are removed from the population and the remaining lines multiplied to form the first officially **certified Breeder Seed**.

2014 – Harper starts the process to give private companies control over which "best crosses" go on to ***varietal finishing*** *- Private Companies now the gate keepers – conflict of interest*

Stage Two: Varietal Finishing: **2 to 8 years**

-Part Four: Winners are sent to *SIU* (Indian Head Research Stn) for multiplication into Pedigreed Breeder Seed Stocks
-Part Five: Pedigreed Breeder Seed sold to Pedigreed Seed Growers (farmers)
Harper ends independent CFIA inspection of Pedigreed Seed Growers in 2014
-Part Six: Pedigreed Seed grower multiplies Breeder Seed – "rogues" first and second year plantings for atypical plants
-Part Seven: Pedigreed Seed grower has enough seed to sell to commercial farmers as "Bulk Certified Pedigreed Seed"

Royalties to WGRF *100% of royalties reinvested in breeding programs.*

Under the Harper model, royalties on cereals, as is now the case with canola, will go to a private agrochemical seed company

❖**The bottom line is the key roles played by public sector scientists, research centres, and research farms**
- ❖**producing and impartially evaluating improved varieties for Canadian farmers that**
- ❖**fit the agro ecology of the prairies and**
- ❖**meet consumer expectations for quality assurance**

❖**This system of research centres and research farms is key to the operation of performance evaluation trials which select lines with improved performance. These field evaluations are critical to successful plant breeding in the public interest.**

❖**The elimination of research farms would be a crippling blow to these breeding programs as witnessed by the Harper Government's closure of the Regina Research Station which was especially important for durum wheat breeding or the closure of the St. Foy, Quebec research station which specialized in fusarium research.**

Performance Evaluation and Selection

WGRF Barley Technical Committee touring barley plots in Brandon

Pedigreed Seed Production

2014 – Harper starts the process to give private companies control over which "best crosses" go on to ***varietal finishing*** *- Private Companies now the gate keepers – conflict of interest*

Harvesting durum at Glenlea

Under the Harper model, royalties on cereals, as is now the case with canola, will go to a private agrochemical seed company

Basic Plant Breeding

CONFLICT OF INTEREST:

-"Rescue" wheat licensed in 1946. No need for DDT to counter Wheat Stem Sawfly

-Today's midge tolerant wheats are a comparatively new development from public plant breeding

Canola requires insecticides in spite of the fact there are "hairy" canola varieties which would be insect resistant

Should a company that makes insecticides/herbicides be the gate-keeper for this type of research and the finishing of new varieties?

Public Interest verses

Private Interest

Having insect tolerant wheat is worth almost $300 million a year to prairie farmers in better yields and lower pesticide costs

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