



Genomics in Plant Breeding

Breeders perspective

Van Ripley



Genomics in breeding

- Plant breeding;
 - Rapid response to emerging issues i.e. major diseases
 - Tools to improve efficiency of breeding
 - Manipulation of complex traits – selectable components
 - Related species as a source of genes for new traits (non-GMO)
 - Interspecific gene transfer



Genomics in breeding

- How can economic benefits be derived from genomics research;
 - Involvement of breeders in goal setting
 - Rapid dissemination of data to public databases
 - Method development for cost effective application of the technology



Genomics in breeding

- Challenges and opportunities;
 - Cost – impact on limited budgets, vs alternatives
 - Effectiveness vs alternatives
 - Technical knowledge required



Genomics in breeding

- Cost
 - Finite budget to be used for all aspects of plant breeding program – breeder must decide on most efficient use to accomplish goals
 - Cost vs. alternative – i.e. genomics approach to WR vs cotyledonary test
 - Cost of using the genomic tools – has to be as cheap as possible and easy to apply (high throughput)



Genomics in breeding

- Cost
 - Capital costs associated with its use may be prohibitive for some groups
 - Mechanism for reduction in cost over time? i.e. the digital camera example
 - Technology adoption on a broad scale possible with reduction in costs

Genomics in breeding



- Effectiveness
 - Simple traits can often be manipulated effectively using traditional methods
 - Will complex traits be able to be manipulated effectively using the genomics approach?

Genomics in breeding



- Technical knowledge
 - Keeping up with technology – always a big new system or approach on the horizon
 - Adapting the system to your specific conditions i.e. may be used one way in a large company vs another way in a small company
 - Data handling and management



Genomics in breeding

- Bottom line
 - The technology has tremendous potential to accelerate and improve plant breeding
 - Needs to have breeder input in goal setting for the projects from the beginning to ensure relevance to our needs
 - Need to consider method development for cost effective application of technology as part of its development