Plant Breeding Requirements for Applied Plant Molecular Biology. (C07-goodman060843-Oral)

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Abstract:

Breeding progress continues at 1% - 2% per year for yield, with additional gains made for other traits. Virtually all this is due to quantitative factors not handled well by current molecular procedures. Molecular genetics is unlikely to contribute to routine breeding practices until this is overcome. In place are such simply-inherited qualitative traits as Bt and herbicide resistance. What is really needed? Traits that can now only be manipulated with difficulty or that are unavailable. These include obvious, but difficult, traits such as drought/flood tolerance, fungal-toxin resistance, salt tolerance, heat/cold tolerance, and general environmental stability. A 15-year lag time exists between gene discovery and seed sales to farmers. It is unlikely that this lag can be reduced, so new developments in molecular genetics must promise 20 - 30% improvement or they are unlikely to survive the 15-year development curve. Over one-third of the 15-year development period is laboratory/greenhouse experimentation. Another third is breeding related, and one third is extensive field evaluation; shortchanging the latter risks serious legal liability.

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