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### Rapid development of a castor cultivar with increased oil content

Castor seed oil contains 90% ricinoleic acid which has a wide range of industrial applications. Improvement in oil content would be of great benefit to castor growers and oil processors. Two cycles of phenotypic recurrent selection were conducted through screening for high oil content castor seeds using magnetic resonance spectroscopy (NMR). Selection increased mean oil content of a base population (Cycle 0) of cultivar Impala from 50.33% to 53.87% in Cycle 1 and 54.47% in Cycle 2. Gains from Cycle 1 and Cycle 2 were 3.54% and 0.6%, respectively. The small gain in the second cycle indicated a genetic ceiling of oil content or the genetic variability of the base population was extensively explored. Nevertheless, the 54.47% mean oil content of Cycle 2 ranks the selected material in the top 1% of the entire 1103 castor accessions maintained at United States of Department of Agriculture. Because of the recurrent selection, we found average seed weight was also increased from 0.44 g in Cycle 0 to 0.50 g in Cycle 1 and 0.54 g in Cycle 2. Correlation between oil content and weight was moderate ( $r=0.43$ ,  $p<0.0001$ ) in Cycle 0, and strong in Cycle 1 ( $r=0.63$ ,  $p<0.0001$ ) and Cycle 2 ( $r=0.77$ ,  $p<0.0001$ ). To our knowledge, this is the first report of utilizing NMR and recurrent selection for improving oil content in castor.

### Biography

Grace Chen has obtained her PhD from University of Wisconsin at Madison, and Postdoctoral studies from University of California. Plant Gene Expression Center. She has published more than 69 papers in reputed journals and is globally recognized as an expert in Oilseed Biotechnology.

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