

Agracast Breeding Program

Congreso Bioturbosina Sep 2018

Initial Goals for Castor Breeding Program



- ◆ Indehiscent genotypes to avoid shreading .
- ◆ Genotypes designed for Mechanical harvest .
- ◆ Hybrids yielding more than 3 ton/ha and oil content upper 50 %.



- ◆ Genotypes to be planted at high planting density.
- ◆ Genetic resistance to gray mold (*Botrytis sp*)
- ◆ Female parents with 100% of female flowers



Breeding strategy

Breeding Tools

Traditional breeding

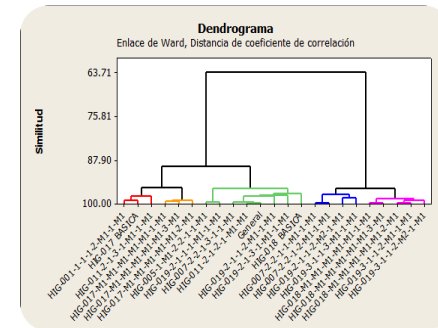
- Phenotyping
- Selection
- Hybridization
- Backcrossing



Monitoring and correlating the obtained data with weather conditions

Experimentation

- Informatics
- Statistics



July 2011, first trial of early generation of hybrids, at Tizimin, Yuc and Obregon Son.

April 2013 Second generation of hybrids trial at Mexicali, B.C., and Nayarit.

Breeding and evaluation locations in Mexico

CD OBREGON, SON



TIZIMIN, YUC



SANTIAGO IXC., NAY



CULIACAN, SIN



COCULA, GRO.



promising hybrids evaluation and current commercial production

LOOKING FOR NEW COMMERCIAL PRODUCTION AREAS

Sources of germplasm underlying Castor Breeding Program

- **315 international accessions from USDA, Sao Paulo State University, Texas Tech University.**
- **Numerous collections of native castor native material in Sonora, Veracruz, Jalisco, Oaxaca, growing on specific soil conditions like saline areas, drought conditions and rain water supply.**
- **OP varieties from seed companies.**
- **USDA materials reported with oil content ranking from 55% to 60% (6 collections).**
- **One Collection as source of racemes with divided peduncles (Southern California)**
- **Short petioles mutant found in an Agracast breeding line.**

Traits discovery

New potential source of Botrytis resistance wild Manihot (Akche mayan name) with common traits with Castor.



Akche fruits



Castor fruits



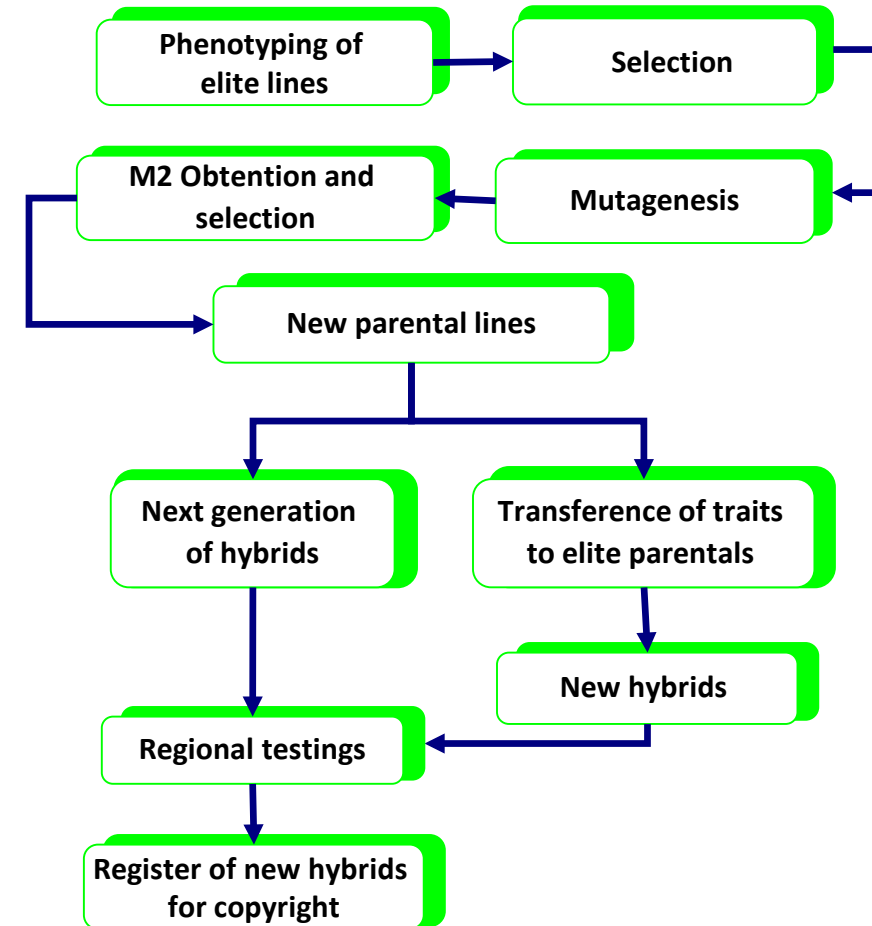
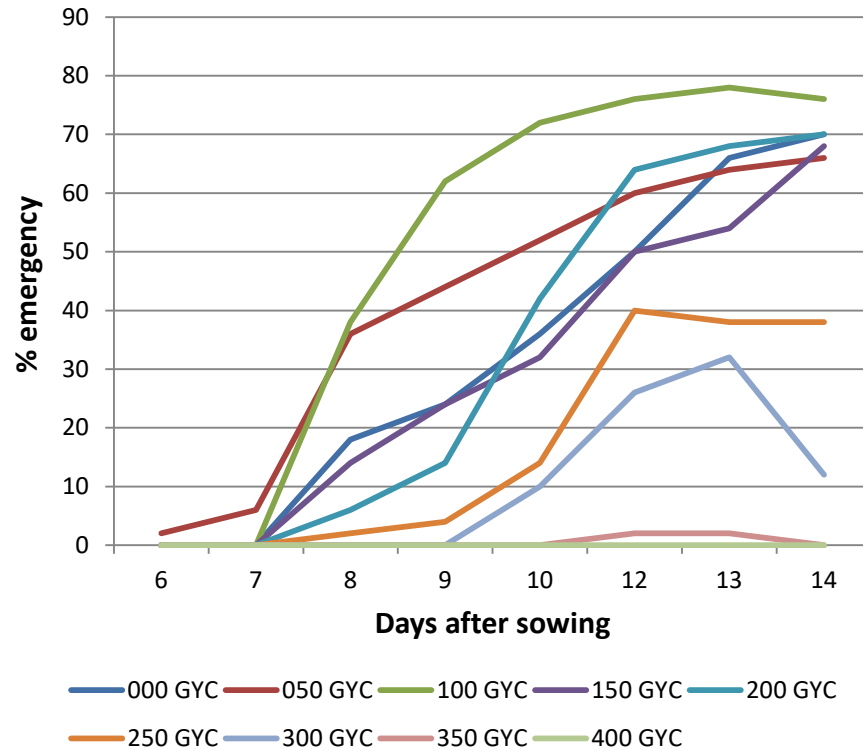
Akche seeds 18.3
oil



Castor Seeds
about 50% oil

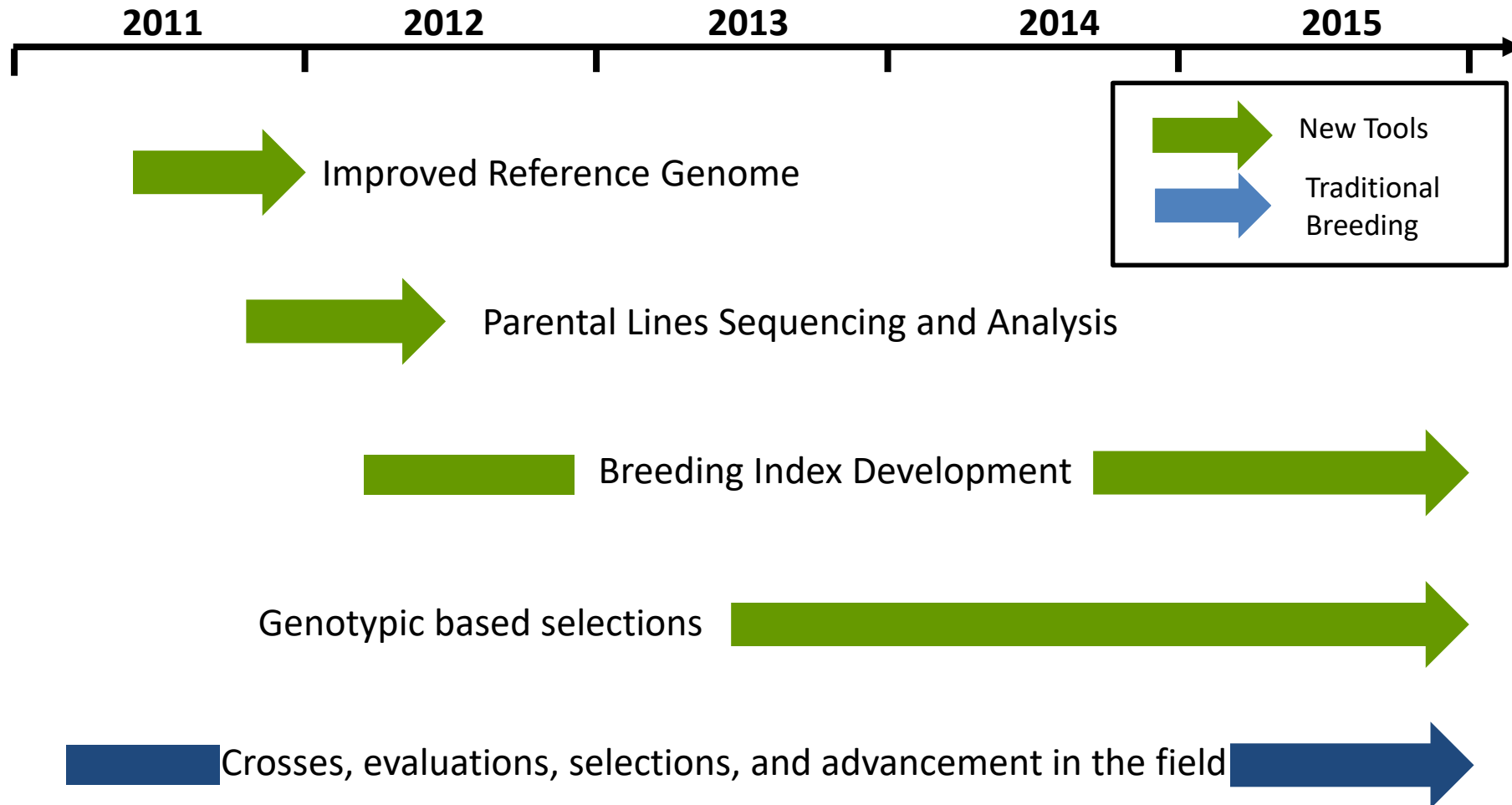
Other actions to generate genetic variability used on the castor breeding program

Gamma ray dosages



Molecular Breeding

Castor Genetic Improvement Program



Molecular Targets for Marker Assisted Breeding

Primary Phenotypic Traits

- Plant height
- Number of female fruit
- Number of male flower

Secondary Phenotypic Traits

- Botrytis Resistance (May have from mutagenesis)

Tertiary Phenotypic Traits

- Salt tolerance - third
- Water use / drought tolerance – third
- Oil content (USDA lines 55-60%)

Quaternary Phenotypic Traits

- Oil composition modification– fourth - GMO
- Ricin content elimination is part of long term vision (US) – GMO

Discovery Traits

- Brachitic (short internodes and petioles)



Phenotypic Changes induced in Castor by breeding



Wild types with very tall plants



Wild types small racemes



Botrytis Disease

Castor new hybrids for mechanical harvest



Thanks!!!