

Corn Traits ELISA Testing

ELISA (Enzyme Linked Immunosorbant Assay) detects the protein produced from the introduced transgenic DNA through an antibody-antigen reaction. Corn borer, corn rootworm, Enlist™, and drought tolerance proteins can be detected with this method. Protein is extracted from individual seed or week-old seedling material to determine the presence or absence of the specified protein. An antibody that will react with the specified protein is coated on a 96 well plate and a conjugate enzyme is added in addition to the extracted protein. During an incubation period, the specified protein will adhere to the antibody on the plate and the conjugate enzyme will adhere to the specified protein. This 'sandwich' will remain after the plate is washed and a substrate that will react with the conjugated enzyme is added to show a color change for the presence of the specified protein.

Positive and negative controls are run on each plate to confirm correct conditions for a valid test. For an initial test, 90 seeds are routinely run, with additional seed if it does not pass the stated purity requirements. A 30 seed test is typical for conditioned or bagged lots.

CORN PURITY AND HYBRID VERIFICATION - ELECTROPHORESIS

Isozyme Testing separates proteins based on 5–6 different isozymes in the corn genome that have the highest variation. Corn seed must be germinated in dark conditions, extracted and placed on starch gels that are 3/8 inch thick. After the protein is separated by size within the gel, it is sliced into thin slices and stained with enzymes in which the particular isozymes are visualized. Offtypes, female selfs, and variants present in the 96 seed sample are reported for genetic purity.

Hybrid verification can be completed on 30 seeds by confirming hybrid isozyme patterns produced by the female and male inbred isozyme patterns.

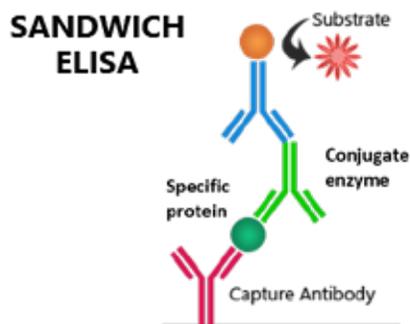


FIG. 1. Image from BosterBio.

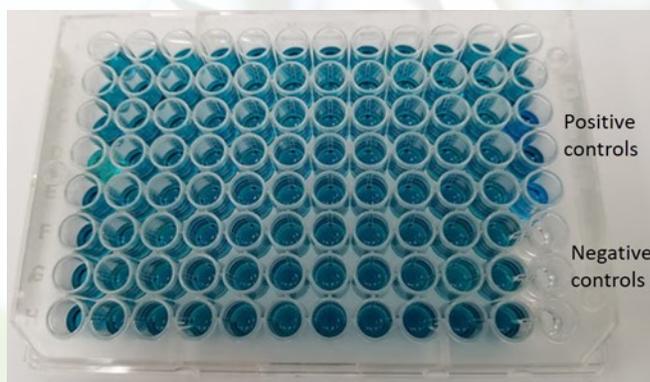


FIG. 2. ELISA plate for insect trait confirmation

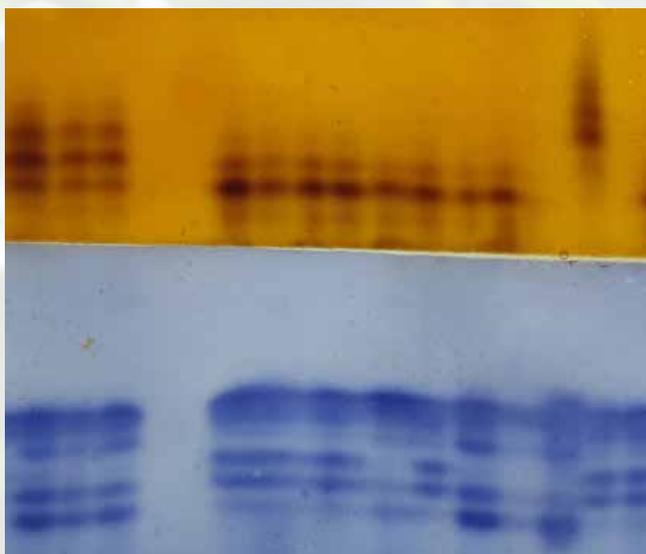


FIG. 3. ACP and MDH patterns on starch gel

Trait Events for ELISA Testing

TYPE/EVENT	PROTEIN	TRAIT	TRAIT PROVIDER
CB-Bt11	Cry1Ab	Agrisure® CB	Syngenta
CB-Mir162	VIP3A	Viptera® CB	Syngenta
CB-Mon810	Cry1Ab	YieldGard™ CB	Monsanto
CB-Mon89034	Cry2Ab2 +Cry1A.105	YieldGard™CB	Monsanto
CB-TC1507	Cry1F	Herculex® CB	DOW AgroSciences
DG-Mon87460	cspB	DroughtGard®	Monsanto
DURA-5307	eCry3.1Ab	Duracade® RW	Syngenta
HT-DAS40278	AAD1	Enlist™	DOW AgroSciences
RW-DAS591227	Cry34/35	Herculex® RW	DOW AgroSciences
RW-Mir604	mCry3A	Agrisure® RW	Syngenta
RW-Mon863	Cry3bb	YieldGard™ RW	Monsanto
RW-Mon88017	Cry3Bb + RR	YieldGard™ RW	Monsanto