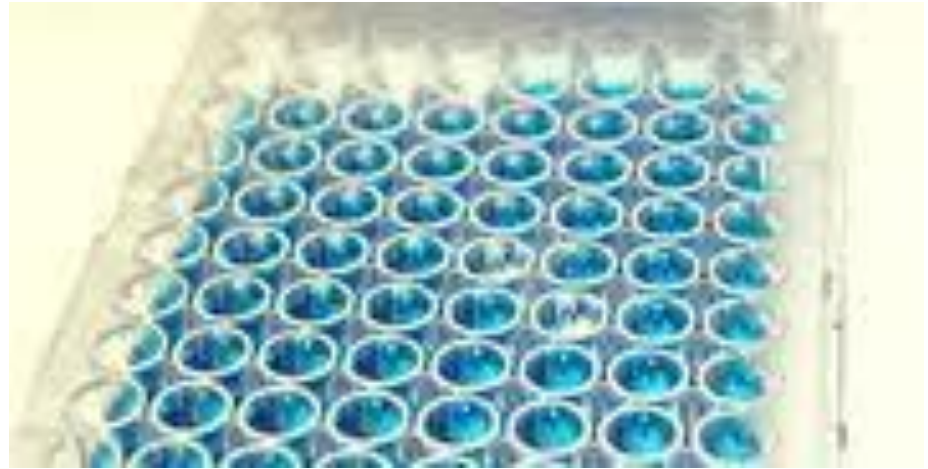


Agrisure Corn Trait Purity Testing Standards








Indiana Crop Improvement Association Fall Trait Testing Seminar
August 14, 2015

Kevin Peyton
NA 3rd Party Quality Lead





- A Syngenta-approved lab must be used for all trait purity testing. A list of approved labs is emailed to all licensees.
- Seed companies are responsible for maintaining copies of all trait purity tests; data from such testing must be available to Syngenta upon request.
- This discussion covers hybrid trait purity testing standards only. For all other information on Agrisure Technology Stewardship (e.g. IRM, refuge requirements and grain marketing), please refer to Agrisure Traits Stewardship Guide available on <http://www.greenleafgenetics.com>.

Traits	Syngenta Trademark(s)
Bt11 Cry1Ab (ECB resistance) Pat (Glufosinate tolerance)	
MIR604 CRW resistance	
GA21 Glyphosate tolerance	
MIR162 Broad spectrum Lepidoptera resistance	
5307 Broad spectrum	
Stacks* Broader control, flexible herbicide use	 

*Multiple trait combinations are possible, but not all listed here.

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Trait Testing Methods

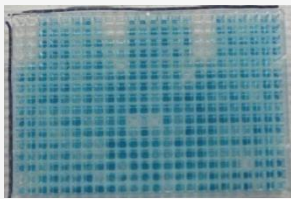
❑ Bio Assays using a Herbicide

- Towel
- Kimpac
- Spray

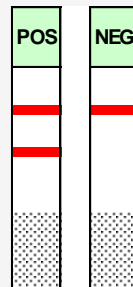


❑ Qualitative ELISA (+/-)

Plate ELISA



Test Strips



TYPE OF TESTS REQUIRED

Agrisure® CB/LL (Bt11)	Glufosinate -Liberty	<ul style="list-style-type: none"> • Lab bioassays • Over the top sprays
Agrisure® GT (GA21)	Glyphosate	<ul style="list-style-type: none"> • Lab bioassays • Over the top sprays
Agrisure® RW (MIR604)	mCry3A specific (+/-) ELISA	<ul style="list-style-type: none"> • Test Strips or Plate ELISA on leaves or embryos only, not seed
Agrisure Viptera® (MIR162)	VIP3A specific (+/-) ELISA	<ul style="list-style-type: none"> • Test Strips or Plate ELISA on leaves or embryos only, not seed
Agrisure Duracade® (5307)	eCry3.1Ab specific (+/-) ELISA	<ul style="list-style-type: none"> • Test Strips or Plate ELISA on leaves or embryos only, not seed

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Trait Testing Standards

Trait	Trait Purity Required (%)
Agrisure® CB/LL (Bt11)	96
Agrisure® GT (GA21)-Female donated	98
Agrisure® GT (GA21)-Male donated	96
Agrisure® RW (MIR604)	96
Agrisure Viptera® (MIR162)	96
Agrisure Duracade®(5307)	96

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SAMPLE SIZE FOR TRAIT PURITY TESTING

Trait	Sheller Samples (prior to conditioning)	Finished Seed Lots (Sheller samples previously tested)	Finished Seed Lots (Sheller samples previously NOT Tested)
Agrisure® GT (GA21)	400	100	400
Agrisure® CB/LL (Bt11)	400	100	400
Agrisure® RW (MIR604)	90	30	90
Agrisure Viptera® (MIR162)	90	30	90
Agrisure Duracade® (5307)	90	30	90

In case the test results do not meet the required purity standard on the first run, see the decision tree provided for additional and subsequent options available, and/or consult Syngenta Contact.

“Bulk/sheller run tests do not replace finished lot tests”

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Agrisure® Traits Hybrids QA Requirements



- Test all sizes of the sheller samples if the trait is male donated, and test two predominant sizes, if the trait is female donated.
- Every new lot and also lots created by blending require testing.
- Agrisure® Traits Hybrids stacked with multiple traits must be tested for all traits.

Agrisure Hybrid E-Z Refuge

Trait Testing Standards- Primary Component

Trait	Trait Purity Required (%)
Agrisure® CB/LL (Bt11)	96
Agrisure® GT (GA21)-Female donated	98
Agrisure® GT (GA21)-Male donated	96
Agrisure® RW (MIR604)	96
Agrisure Viptera® (MIR162)	96
Agrisure Duracade®(5307)	96
Herculex® I (HX1)	96
Herculex® RW (HXRW)	96

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Agrisure Hybrid E-Z Refuge

SAMPLE SIZE FOR TRAIT PURITY TESTING - PRIMARY COMPONENT

Trait	Sheller Samples (prior to conditioning)	Finished Seed Lots (Sheller samples previously tested)	Finished Seed Lots (Sheller samples previously <u>NOT</u> Tested)
Agrisure® GT (GA21)	400	100	400
Agrisure® CB/LL (Bt11)	400	100	400
Agrisure® RW (MIR604)	90	30	90
Agrisure Viptera® (MIR162)	90	30	90
Agrisure Duracade® (5307)	90	30	90
Herculex® I (HX1)	90	30	90
Herculex® RW (HXRW)	90	30	90

In case the test results do not meet the required purity standard on the first run, see the decision tree provided for additional and subsequent options available, and/or consult Syngenta Contact.

Bulk/Sheller run tests do not replace finished lot tests

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Agrisure Hybrid E-Z Refuge

Trait Testing Standards- Refuge Component

Trait	Trait Impurity Required (%)
Agrisure® CB/LL (Bt11)	≤5%
Agrisure® RW (MIR604)	≤5%
Agrisure Viptera® (MIR162)	≤5%
Agrisure Duracade® (5307)	≤5%
Herculex® HX1 (TC1507)	≤5%
Herculex® HXRW (DAS-59122-7)	≤5%

If any event exceeds 5%, the blend ratio will be required to be modified in order to use as refuge. Contact GreenLeaf Genetics for specific blend instructions and include all test results with the modification request.

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Agrisure Hybrid E-Z Refuge

SAMPLE SIZE - TRAIT PURITY TESTING REFUGE COMPONENT

Trait	Sheller Samples (prior to conditioning)	Finished Seed Lots (Sheller samples previously tested)	Finished Seed Lots (Sheller samples previously NOT Tested)
Agrisure® GT (GA21)	400	100	400
Agrisure® CB/LL (Bt11)	90	NA	90
Agrisure® RW (MIR604)	90	NA	90
Agrisure Viptera® (MIR162)	90	NA	90
Agrisure Duracade® (5307)	90	NA	90
Herculex® HX1 (TC1507)	90	NA	90
Herculex® HXRW (DAS-59122-7)	90	NA	90

In case the test results do not meet the required purity standard on the first run, see the decision tree provided for additional and subsequent options available, and/or consult Syngenta Contact.

**For negative insect trait testing, test sheller OR finished samples.
However, GA21 testing follows sheller and finished sample schemes.**

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