

Final Report

Hj'h'Y.	H\Y'A i'h]X]gW]d']bUfm' JYf a cbh'9 I hYbg]cb'= a d'Y a YbhUh]cb'Dfc [fU a '5XXfYgg]b ['GhU_Y\c'XYf'Df]cf]h]Yg'UbX BYYXg'Zcf'&\$%(!&\$%+		
Gdcbgcf]b ['5 [YbWm	ÞQØCE	Dfc^YWh'GhU h ig	ÔUTÚSÒVÒ
: i bX]b ['Gc i fWY	Þ [ ]ÁØ [ i { ~ æ	FYdcfh]b [ ' : fYe i YbWm	Ø}æ
5WWYgg]cb' Bc"	F€€IJJÌ	; fUbhg" [ c j' Bc"	
Dfc^YWh' Bc"	XVÞGJG€G	5 kUfX' Bc"	G€F I È Ì € € € Ì È G G Í Ì Ì
Dfc^YWh' GhUfh' 8UhY	€JÐ€FÐG€FÌ	DfcdcgU' Bc"	G€F I È € Ì Ì € Ì
FYdcfh]b [ 'DYf]cX' GhUfh' 8UhY	€JÐ€FÐG€FÌ	Dfc^YWh' 9bX' 8UhY	€ÌÐHFÐG€FÌ
G i V a ]hhYX' 6m		FYdcfh]b [ 'DYf]cX' 9bX' 8UhY	€ÌÐHFÐG€FÌ
		8UhY' G i V a ]hhYX' hc' B: = 5	

Dfc [fU a '7cXY. EIP

Dfc^YWh' 8]fYWhcf

CE} }ÁPæ: ^|!ä\*\*  
 Ì€GÈÌ Ì Ì È€I JH  
 æ} }È@æ: ^|!ä\*\* O ~ç { È^ä~

FYW]d]Ybh' Cf [Ub]nUh]cb

WÞQXÒÜÙQVÝÁUØÁXÒÜT UÞVÁBÁÙVCEVÒ  
 Ì Í Á Ù Á Ù Ù Ù Ù Ù Ò Ò V Á Ù V  
 Ó ~ |!æ } \*c [ ] È Á X V Á € Í I € I € € € €  
 Ö W Þ Ù Á Þ [ È € Ì Ì Ì F F F F

7c!Dfc^YWh' 8]fYWhcf

Ù\ä} }^!ÈÁTæ! \*æ!^c  
 Ó [ • , [ !c@ÈÁÙä} }^  
 Öæ!à^ÈÁP^æc@^!  
 Ó!æâ•@æ , ÈÁV^!^ }&^

Bcb!HYW\ b]WU' G i a Ufm

V@^ÁXVÁÒQÜÁ~ •^•ÁæÄ { ~|cäÈä&ä]j}æ!^Áæ }! [æ&@Ac [ Áæäâ!^••ÁQÜTÁ ] iä [ !cä^•Áæ } äÁ } ^ ^ ä • Á ä ^ çä-â^äÁà^ Á [ &æ|Áæ } äÁ!^\*ä [ ]æ|Á•cæ\^@ [ ]ä^!É  
 V@^Á- [ ~ • Á [-Ác@^Á ] : [ \*!æ { Áä } &| ~ ä^•Á- [ !æ\*^•ÈÁ\*!æä } •Áæ } äÁ-â^!äÁ& [ ] •ÈÁ\*!^• } @ [ ~ ^Áæ } äÁ|æ } ä•&æ ^Á [ ] ^!æcä [ ] •ÈÁæ } ] | ^•Áæ } äÁ\*!æ ] ^•È  
 & [ { { } äcä^•ÈÁ\*æ!ä^ } •Áæ } äÁ ] |æ } çäâæ\* } [ •cä&•Á- [ !Ác^•^cæä|Áæ } äÁä^!i^Á\*! [ , ^!•Áæ } äÁ [ c@^! •ÈÁV@^Á ] iä [ !cä^Á [-Ác@^Á ] : [ \*!æ { Áä•Ac [  
 ä^ç^ [ ] Áæ } äÁ ] : [ [ c^Áäâç^! •^Áæ|c^! ] æcäç^Á ] ^•cÄ [ æ } æ\* { ^ } cÄcæ&cä&•Ac@æcÄ , ä|Á@^! ] Á\*! [ , ^!•Á ] : [ ä~ &^Á@ä\* @Ä~ æ|äc^Á& [ ] •ÈÁ ] : [ ä~ &^É  
 [ ! ] æ { ^ } çæ|•Á [ !Á]æ } ä•&æ ] ^•Á , @ä|Á { ä { ä } ä { : ä } \*Áä ] ] ~ çÄ [ •c•Áæ } äÁä { ] æ&c•Ác [ Á@^æ|c@Áæ } äÁc@^Á^ } çä! [ ] { ^ } cÈÁV@^ÁXVÁÒQÜÁcæ {  
 ä } &| ~ ä^•ÁæÄ ] |æ } çÄ ] æc@ [ ] [ \*ä•cÈÁ@ [ !cä&~|c~ iä•cÈÁæ\*! [ ] [ { ä•cÈÁ , ^ÁäÁ• ] ^&äæ|ä•cÈÁ^ } c [ [ [ [ \*ä•cÁæ } äÁæ& [ { { } äc^Á [ ~c!^æ&@Ä ] : [-^••ä ] æ|È

5WWc a d'g\ a Ybhg

AU'cf' [cU'g'c'z'h\Y' d'fc^YWh

V@^Á { æb [ !Á\* [ æ|Á [-Ác@^Á ] : [ b^•cÄæ!^Ác [ Áä ] &!^æ•^Ác@^Áæä [ ] çä [ ] Á [-ÁQÜTÁ ] !æ&cä&^•Áä } ÁæÁçæ!ä^c^ Á [-Á&! [ ] •Áæ } äÁ^ccä } \*Ác [ Á!^ä~ &^Ác@^  
 æ { [ ~ ] çÄ [-Á ] ^•cä&ä^•Á~ •^äÁæ } äÁc [ Á [ , ^!Á& [ •c•Á , @ä|Á ] : [ c^&cä } \*Ác@^Á^ } çä! [ ] { ^ } çÄæ } äÁ@~ { æ } Á@^æ|c@È

K\Uh' kUg'UWw c a d'g\YX' i bXYf'h\YgY' cU'g3

< [ \ ] [ \ hg. `GYdhY a VYf' &\$% ( ' ! 5 i [ i gh' &\$%+  
 5 [ fcb c a m' : ] Y' X' 8Umg

ÁÁÁÁ`ÁÁ Ì È Ì J Á Ä ä { ] : [ ç^ä^!^æä } Á~ æ|äc^ÈÄ { ] : [ ç^ä^Á& [ ] [ { ä&•Þçæäæ|äc^  
 ÁÁÁÁ`ÁÁHF`ÁÁä^ç^ [ ] ^äÈÄä { ] | ^ { ^ } c^ä^ÁæÁ•& [ ~cä } \*Á ] : [ \*!æ {  
 ÁÁÁÁ`ÁÁÁÁQÁ , æ•Áæä|Ác [ Áä^ä^ } çä-^ÁU [ çæc [ Á!^æ-@ [ ] ] ^! •Áä } ÁæÁ&|ä^ } çÄ-^Á^|äÄ  
 ÁÁÁÁ`ÁÁÁÁQÁ@æç^Ää { ] | ^ { ^ } ç^ä^ÁæÁ^cc^!Á { æ } æ\*^ { ^ } çÄ•^•c { Á , äc@Ä , @^æcÄ [ Á!^ä~ &^Áää•^æ••Á  
 5 [ fcb c a m' K ] bhYf' 7 cbZYfYbWYg

Dfc [fU a 'BU a Y. Extension Implementation Program

DYfZcf a ]b [ ' 8 YdUfha Ybh

Òçc^ } •ä [ ] ÁÈÁÙ! [ \*!æ { Áæ } äÁØæ&~|c

8YdUfha Ybhg

Plant and Soil Science  
 Extension - Program and Facult  
 Plant & Soil Science

.....5WWYggjcb'Bc"%\$\$(-,.....Dfc^YWh'Bc"JHB&-&\$\$

ÁÁÁÁ~ÁÁCE} } ~æ|ÁÖ:æä}ÁÖ: [ , ^:ÁÖ [ ]-^!^)&^•  
 ÁÁÁÁÁÁÁÁ~ÁÁHJÈI Ì ÁÁ { }! [ç^á^\*!æä}Á ~æ|äc^Áç [ ]!^!Á &~|cäçæ!Á•^!^&cä [ ]ÉÁà^cc^!Á! [ cæcä [ ] •ÉÁcä { ^|^Áæ!ç^•cD  
 ÁÁÁÁÁÁÁÁ~ÁÁHHÁÁ { }! [ç^á^, ^!á^& [ ]c! [ |Á•c!æc^\*á^•  
 ÁÁÁÁÁÁÁÁ~ÁÁÁQÁ } ^!á^c [ Á ]æ } Áá } Áæäçæ } &^Á [ ]Á@ [ , ÁQÁ , ä| |Á , æc&@Á- [ !Ááá•^æ•^ÉÁ!æ! } Á , @æcÁç [ Á ] [ \Á- [ !ÉÁ@ [ , Ác [ Ác^•cÉÁ { ä } ä : ^Á!á•\Á  
 ÁÁÁÁÁÁÁÁ~ÁÁÁQcÁ•Á• [ Á!^ { æ! \æä!^Ác@æcÁ• } &@ÁæÁ\* [ [ á^Áç^ ] cÁ•Ááç [ c^ÁÁc [ Á•~&@ÁæÁ-!á } ^!Áæ\*!á&~|c~!æ|Á^ } á^æç [ !Á  
 ÁÁÁÁÁÁÁÁ~ÁÁÁÖç&^!^ } cÁáá&~••á [ ]Á , äc@Á! } æ&cä&æ|Áæ [ ] |á&æcä [ ] •Á  
 ÁÁÁÁ~ÁÁCE} } ~æ|ÁP [ ] •ÁÖ [ ]-^!^)&^•  
 ÁÁÁÁÁÁÁÁ~ÁÁ Í È Í Á ÁÁ { }! [ç^á^& [ ] ~cä } \*Á•\ä| |•  
 ÁÁÁÁÁÁÁÁ~ÁÁ Í H Á ÁÁ { }! ^ { ^ } c^á^&! [ , } ä } \*Ác [ Á& [ ] c! [ |Áá [ , } ^ } Á } ä|á^ ,  
 ÁÁÁÁÁÁÁÁ~ÁÁ Í Á ÁÁ { }! [ç^á^@ [ ] Á ~æ|äc^  
 ÁÁÁÁÁÁÁÁ~ÁÁÁQÁ , æ•Áç^!~Áá { }! ^••^áÁ , äc@Ác@^!Á& [ ]-^!^)&^ÉÁQÁ\* [ cÁæ|Ác@^!Áá ]- [ ÁQÁ } ^!á^áÁc [ Á^cÁ•cæ!c^áÁ  
 ; fu]b'8]gYUgY'G i f j Ym

ÁÁÁÁ~ÁÁQÁ^ } cä-á^áÁ } ^•c•Á } [ cÁ ]!^çá [ ~•|^Áá^ } cä-á^áÁ } Ác@^!á-á^!á•ÉÁQæ! { ^!•Á!æ! } ^áÁ@ [ , Ác [ Ááá^ } cä-^Ác@^!Á } ^•c•  
 ÁÁÁÁ~ÁÁ Y [ !\^áÁ , äc@Á [ ] ^!-æ! { Á [ ] Ááá^ } cä-á&æcä [ ] D { æ } æ\*^ { ^ } cÁ [-Á| [ ] \*Ác^! { Ááæ&c^!áæ|Áááæ } Áá!á\* cÁ ]! [ à|^ {  
 ÁÁÁÁ~ÁÁV , [ Á-æ! { •Á~ } \ } , ä } \*|^Á ]æ } c^á^áæ } c@!æ& [ ] •^É& [ ] cæ { ä } æc^áÁ•^!áÉÁ!æáá } \*Ác [ Á ] €€€€ÁÁ [ ••ÉÁUæc@ [ ^\* ] Ááá^ } cä-á^áÁ } ÁU|æ } c  
 Öææ\* [ •cä&ÁÖ!á } ä&ÉÁ•^!á^•^!^!Á } [ cä-á^á  
 ÁÁÁÁ~ÁÁU [ ~c^á^á-æ! { •Á@æç^Á { ä } ä { ä : ^áÁ } ^•cä&áá^!Áæ [ ] |á&æcä [ ] Á!Ááá [ ] c^á^Á } ^ , Á!^cÁ& [ ] c! [ |Á•c!æc^\*á^•  
 @ccgY'G a ih'GYX'@ch'HYgh]b [

ÁÁÁÁ~ÁÁQæ! { ^!•Áæ!^!æä!^Ác [ Ááá^ } cä-^ÁŠ [ [ •^Á• { ~cÁá } Á-á^!áÉÁ\ } , [ , Á ] [ cÁc [ Á•æç^Á•^!á^!-! [ { Áá }-^&c^á^á-á^!á•Á- [ !Á ]æ } cä } \*  
 ÁÁÁÁ~ÁÁU } |^Á [ ] ^! [-Á- [ ~!Á& [ ] cæ { ä } æc^áÁ [ c^Ác^•c^áÁ [ [ •áç^ÉÁá } áá&æcä } \*Á&~!^!cÁ { ^c@ [ á^Á- [ !á^c^! { ä } ä } \*Áá }-^&cä [ ] Áá } Á• { æ|Á\*!æä } •Áæ!^!  
 } [ cÁ!^!æä!^ÉÁà^cc^!Ác^•cä } \*Á { ^c@ [ á^Á } ^!á^Ác [ Áá^á^Áç^! [ ] ^áÉ  
**5dd'Y'9 I hYbgjcbz' C i hfYUW\z'9X i WU]h]cb**

ÁÁÁÁ~ÁÁXVÁV!^!ÁQ!~áçÁÖ: [ , ^:ÁÖ•• [ &áæcä [ ] Áæ } } ~æ|Á { ^!cä } \*•  
 ÁÁÁÁÁÁÁÁ~ÁÁ Í H Á Á&@æ } \*^!á^áá^!ÁÖ!á\* cÁ { æ } æ\*^ { ^ } cÁç&æ } \!^!áá^ } cä-á&æcä [ ] D!^ { [ çæ|ÉÁ { æ } æ\*^ { ^ } cÁ { [ á^!•ÉÁcä { ä } \*DLÁH€ÁÁ~•^!á!BÖYCE  
 æ•Áá^!á&á^!Ác [ [ |Á- [ !Á•c!^ ] c [ { ^&á } Á~•^  
 ÁÁÁÁÁÁÁÁ~ÁÁGJÁÁ&@æ } \*^!á^Ác [ ] |ÁU&æáÁ { æ } æ\*^ { ^ } cÁç [ ] ^•cä&áá^!Á•^!^&cä [ ] DLÁHHÁÁ&@æ } \*^!áUÖPQÁ~ } \*á&áá^!~•^!çæ|c^! } æcä } \*Ááá-^!^ } c  
 &@^ { ä•c!á^•D  
 ÁÁÁÁÁÁÁÁ~ÁÁG€ÁÁ&@æ } \*^!á^Ác [ ] |ÁU^! ]æ } cÁÖá•^æ•^!Á { æ } æ\*^ { ^ } c  
 ÁÁÁÁÁÁÁÁ~ÁÁ Í Á Á&@æ } \*^!á^Ác [ ] |ÁU^! ]æ } cÁÖá•^æ•^!Á { æ } æ\*^ { ^ } cÁç { æcä } \*Ááá•!~ } cä [ ] ÉÁcä { ä } \*D  
 ÁÁÁÁÁÁÁÁ~ÁÁÖ@æ } \*^!Á { [ •cÁ [-c^ ] Á { æ^!Ác [ Áá { }! [ ç^Á ] ^!cÁ { æ } æ\*^ { ^ } cÁ& [ ]-áá^ } &^ÉÁá^!^!æ•^!Á } ^•cä&áá^!~•^!ÉÁ!á^~&^!~•^!Á [-Á! [ æá  
 • ] ^&c!~ { Á } ^•cä&áá^!ÉÁ { }! [ ç^Á&! [ ] Á ~æ|äc^  
 ÁÁÁÁÁÁÁÁ~ÁÁÁQÁ- [ ~ } áÁQÁ , æ•Á } [ cÁ ]æ&á } \*Á• [ { ^Á [-Á { ^!á } •^&cÁc!æ } •Á& [ !!^&c!~Á  
 ÁÁÁÁÁÁÁÁ~ÁÁÁŠ!æ! } ^!áÁ { [ !^!áæá [ ~cÁ } ^!á^Ác [ Á { [ ] äc [ !ÁÖTÜÓÁá^!-!^!Ác!^æcä } \*Á





.....5WWYgg]cb' Bc"%\$\$ ( - , .....Dfc^YWh' Bc" JHB&-&\$\$

ÁÁÁÁ~ÁÁWÜÖÉÁÉÜÜÁÁØä|ÁÖ~äá^Á- [ !ÁQ]c^!æc^áÁÚ^cÁ Tæ}æ^ ^ { ^}cÁá}ÁP [ ]~ÁÁ~ ] áæc^Á [ }Á [ cæc [ Á|^æ-@ [ ] ] ^!  
@cc]•KDD , , Éæ!~É~•áæÉ\* [ çÐÉÜÜW•^!Øä|Á^ØH!FÉJÐ@ [ ] @æ}àà [ \GÉFÉÉ] ä-  
**5dd'Y'9 I hYbg]cbz' C i hfYUW\z'9X i WU]cb**

ÁÁÁÁ~ÁÁ%& Y jYbhgZÁ)+( 'UhhYbXYYg. Ú]æ} }ä} \*Ð]!^•^} cæcá [ ]•ÁæcÁXVÁV!^ÁØ!~äcÁÖ [ , ^!ÁÉ•• [ &áæcá [ ] Áæ} }~æ|Á { ^cá} \*•Áæ} áÁP^ ,  
Ö} \*]æ} áÁX^\*^cæä|ÁBÁØ!~äcÁÖ [ ]~^!^} &^ÁV , [ Á [ ]É-æ! { Á , [ !•@ [ ] Ác [ ~!•ÉÁP [ !c^æc^!} ÁPÝÁÖ [ { { ^!&áæ|ÁV!^ÁØ!~äcÁÜ&@ [ [ ]É ,  
Ö~^&cáç^ÁU!&@æ!áÁU!}æ^ä} \*ÉÁÖæc^!} ÁPÝÁÖ [ { { ^!&áæ|ÁP [ !cá&~|c~!^ÁU!} \*!æ { ÁÖ@æ { ]}æä} ÁXæ||^ÁU^cæ|ÁØæ||Á T^cá} \*ÉÁWU  
É•• [ &áæcá [ ] Á [ -ÁÖäá^!Á Tæ^!^!ÁÖ [ ]~^!^} &^ÁKÁÉáçæ} &^áÁÖäá^!ÁU!&@æ!áÁU!} á~&cá [ } Á Y [ !\•@ [ ] ÉÁP [ ] ÉÖ@^ { ä&æ|Á Y^ÁÁ Tæ}æ^ ^ { ^}  
ä} ÁP [ !c^æc^ÁÉ] ]|^ÁU!&@æ!á~  
**5dd'Y'9 I hYbg]cbz' C i hfYUW\z'9X i WU]cb**

ÁÁÁÁ~ÁÁGFÉJ I ] Á}æ^ ^Áçá^ , •Á [-ÁWX TÁØ!~äcÁV!^ÁØ!~äc  
@cc]KDD , , É ç { É^á~Ðd-!~äcÐNÜæ^ÁMc!^~!~äcÐc- [ { ^É@c { |BÜ TMc- '•~à { ^} ~É@c { |  
ÁÁÁÁ~ÁÁF Í ÁÁ { æ|Áæáá!^••^Á•~à&!áá^áÁçæ} ]|^\*! [ , ^!Ö|á~cÉ~ç { É^á~É  
ÁÁÁÁ~ÁÁFG Í ÁQÚ TÁà [ \*Á ] [ •cÁcc]KDDà [ \*É~ç { É^á~Ð-!~äcÐ  
ÁÁÁÁ~ÁÁFÁ [ ]•cÁc [ Á^Yc^} •ä [ ]  
ÁÁÁÁ~ÁÁFJGA [ ]^É [ ]É [ ]^Á& [ ]•~|cæcá [ ]•  
ÁÁÁÁ~ÁÁÉ} }~æ|Á^çá•ä [ ]•Á [-ÁP^ , ÁÖ} \*]æ} áÁV!^ÁØ!~äcÁ Tæ}æ^ ^ { ^}cÁÖ~áá^Á@cc]•KDDæ\*É~ { æ••É^á~Ð-!~äcÐ} ~à|á&æcá [ ]•Ð]^ , É^} \*]æ} áÉ  
c!^É-!~äcÉ { æ}æ^ ^ { ^}cÉ\*~áá^  
ÁÁÁÁ~ÁÁFÁÉ { ^!á&æ} ÁU [ &á^c^Á [-ÁP [ !cá&~|c~!æ|ÁU&á^} &^ÁP [ !cQ TÁ-æ&cÁ•@^ÁcÁ@cc]KDD@ [ !cá { Éæ•@• { ^ááæÉ [ !~Ðac^ { •Ð•@ [ , Ð I G  
**5dd'Y'=DA' ; i]XY]bY'5ggYgg a Ybh**

ÁÁÁÁ~ÁÁAQ}c^!æc^áÁÚ^cÁ Tæ}æ^ ^ { ^}cÁçQÚ T DÁÉ••^•• { ^}cÁ- [ !ÁÉ] ]|^Áæ} áÁ Y ä} ÁÖ!æ]^•ÉÁÜá [ cÁU!} \*!æ { ÁGÉF ÍÉGÉF Í Á  
@cc]KDD \* [ É~ç { É^á~Ðà\* Í]H  
; fUdY'9 I hYbg]cbz' C i hfYUW\z'9X i WU]cb

ÁÁÁÁ~ÁÁ ' Y jYbhgZÁ% , 'UhhYbXYYg. Ú]æ} }ä} \*Ð]!^•^} cæcá [ ]•ÁXVÁÖ!æ]^Áæ} áÁ Y ä} ÁÖ [ ~] &á|Áæ} }~æ|Á { ^cá} \*ÉÁP^ , ÁÖ} \*]æ} áÁX^\*^cæä|Á  
BÁØ!~äcÁÖ [ ]~^!^} &^ÁPÝÁBÁXVÁ Y ä}c^!ÁÖ!æ]^ÁU&@ [ [ ]  
; fUdY'9 I hYbg]cbz' C i hfYUW\z'9X i WU]cb

ÁÁÁÁ~ÁÁ Í ÉJ THÁ}æ^ ^Áçá^ , •Á [-ÁWX TÁØ!~äcÁÖ!æ]^ÁcÁ@cc]KDD , , É~ç { É^á~Ðd-!~äcÐNÜæ^ÁM\*!æ]^ÁØ\*!~@ [ { ^É@c { |BÜ T M\*! '•~à { ^} ~É@c { |ÁÁ  
ÁÁÁÁ~ÁÁG Í HÁÁ { æ|Áæáá!^••^Á•~à&!áá^áÁç^! { [ ]}c\*!æ]^ÁÖ|á~cÉ~ç { É^á~  
ÁÁÁÁ~ÁÁ JÉÁQÚ T Áà [ \*Á ] [ •c•  
ÁÁÁÁ~ÁÁ Í Á [ ]^É [ ]É [ ]^Á& [ ]•~|cæcá [ ]•  
ÁÁÁÁ~ÁÁGÁÉ { ^!á&æ} ÁU [ &á^c^Á [-ÁP [ !cá&~|c~!æ|ÁU&á^} &^ÁP [ !cQ TÁ-æ&cÁ•@^ÁcÁ@cc]KDD@ [ !cá { Éæ•@• { ^ááæÉ [ !~Ðac^ { •Ð•@ [ , Ð I É  
@cc]KDD@ [ !cá { Éæ•@• { ^ááæÉ [ !~Ðac^ { •Ð•@ [ , Ð I J  
; fUdY'=DA' ; i]XY]bY'5ggYgg a Ybh

ÁÁÁÁ~ÁÁAQ}c^!æc^áÁÚ^cÁ Tæ}æ^ ^ { ^}cÁçQÚ T DÁÉ••^•• { ^}cÁ- [ !ÁÉ] ]|^Áæ} áÁ Y ä} ÁÖ!æ]^•ÉÁÜá [ cÁU!} \*!æ { ÁGÉF ÍÉGÉF Í Á  
@cc]KDD \* [ É~ç { É^á~Ðà\* Í]H  
=DA' : ]fgh'Zcf' ; fYYb\c i gY' CfbU a YbhU'g

ÁÁÁÁ~ÁÁG Í Á^!^} @ [ ~•^Á [ !]æ { ^}cæ|Á [ ]^!æcá [ ]•ÁçTÍÉÉÁ\*! [ , ^!•DÁ!^&^áç^áÁá} ááçáá~æ|á : ^ááç!æ} ä} \*Ác [ Áá] &!^æ•^ÁQÚ T Áæá [ ]cá [ ]  
ÁÁÁÁ~ÁÁF Í ÉÉÁ} ááçáá~æ|á•áç^áçáç•  
ÁÁÁÁ~ÁÁ& ( 'Y jYbhgZÁ) (\$Z UhhYbXYYg. :P^ , ÁÖ} \*]æ} áÁÖ!^!^} @ [ ~•^ÁÖ [ ]~^!^} &^ÉÁ@á\* @Á•&@ [ [ |Ác^&@Á&^}c^!ÉÁ!^\*á [ ]æ|Á , [ !\•@ [ ]•ÉÁQÚ T  
c [ ~!•ÉÁ] !^•^} cæcá [ ]•Á\*áç^!} Áá~Áæ} ÁQÚ T ÁØ!~äcÁ\*! [ , ^!ÁæcÁV!áÉUcæc^ÁÖ!^!^} @ [ ~•^ÁQÚ T Á Y [ !\•@ [ ]•ÉÁ]^ , •Á•^\* { ^}cÁ [ ]Á [ &æ|ÁVXÉ  
}æcá [ ]æ|Á& [ ]~^!^} &^Á] !^•^} cæcá [ ]  
ÁÁÁÁ~ÁÁV^&@} á&æ|Á•&@ [ [ |Áæáçá• [ !~Á& [ { { ácc^Áá^Áç^! [ ]}á} ÁQÚ T Á~!|á&~!| { Á- [ !Á^!^} @ [ ~•^Á] ! [ á~&cá [ ]Á& [ ~!•^•  
ÁÁÁÁ~ÁÁQÚ T Á- [ !Á [ !]æ { ^}cæ|Á^Á~&æcá [ ]æ|Ááá•] ]æ^ÉÁ! [ &@~!^Á- [ !Á^!^} æ|Á] ~á|á&æcáÖ@æ { ]}æä} ÁXæ||^ÁØæ!ÁÖæ!á^} ÁÖ!^}c^!  
**Hf]!GhUhY' ; fYYb\c i gY'=DA' Kcf\_g\cdg**

ÁÁÁÁ~ÁÁ ' Y jYbhgZÁ ( , \$UhhYbXYYg. :æ} }~æ|ÁV!ÉÜcæc^ÁÖ!^!^} @ [ ~•^ÁQÚ T Á Y [ !\•@ [ ]•  
; fYYb'=bX i ghfm'=DA' U a VUggUXcfg

ÁÁÁÁ~ÁÁFÉÁ~æ!á^} Á&^}c^!•Ð}~!•!á^•ÁçHÉÉÁ\*! [ , ^!•Ð•cæ--DÁ!^&^áç^áÁá} ááçáá~æ|á : ^áá~ [ ] [ !cÁc [ Á^ç] æ} áÁQÚ T Áæá [ ]cá [ ] Áæ} áÁc [ Á•^!ç^Áæ•  
Ö!^!^}ÁQ} á~•c!~Áæ { äæ••æá [ !•  
ÁÁÁÁ~ÁÁ Í ÉÉÁ} ááçáá~æ|á•áç^áçáç•

Final Report

.....5WWYggjcb'Bc"%\$\$(-,.....Dfc^YWh'Bc"JHB&-&\$\$

ÁÁÁÁ'ÁÁ, 'YjYbhgzÁ, Ž'UhhYbXYyg. '@æàææcá[ ]æ}cá} \*Áá^ { [ ] :c!æcá [ ]ÉÁ^cæà|ä=@ { ^ }cÁ [-Á}æc~!æ|Á^} ^ { á^•D@æàææcá[ ]æ}cá} \*•Áá }æ}á•&æ}^•&[ ]^-^}^&^ÉÁV;áEÜcæc^ÁÖ:^^} @ [ ~ •ÁQÚTÁY [ !\•@ [ ] Á ] !^•^ } cæcá [ ] •ÉÁ ] !^•^ } cæcá [ ] •Á- [ !Á } ~ !•!á^•Á [ ] Á!^á~&á } \*Áá } çæ•áç^ ^æ!c@, [ ! { Á { [ ç^ { ^ } c ÁÁÁÁ'ÁÁÖ'•c [ { ^!Áá^ &æcá [ ] Ááá• } |æ~Áæà [ ~cÁ ] ! [ çáá } \*Á@æàææcá- [ !Á } æc~!æ|Á^} ^ { á^•Áá } Á|æ} á•&æ } ^• ÁÁÁÁ'ÁÁQá^ } cã-á&æcá [ ] ÁBÁTæ } æ\*^ { ^ } cÁ [-ÁY @æc^ÁÖ; ~ à•Áá } ÁX^! { [ ] c!•ÁÖ!^^ } •&æ } ^•ÁÁ-æ&c•@^cÉÁáá•• { á } æc^áÁc [ Á|æ} á•&æ } ^ Á ] ! [-^••á ] } æ!•Á@cc ] KDD \* [ É~ç { É^á~Dç; !•G FY [ ] cbU' =DA' Kcf\_g\cdg'zcf '@UbXgWUdYfg

ÁÁÁÁ'ÁÁ&'YjYbhgzÁ ) 'UhhYbXYyg. '@æ|-Éáæ^Á•^ { á } æ!Á [ ] Ááá [ [ \*á&æ|Á& [ ] c! [ |Á- |Á|æ } á•&æ } ^•ÁæcáP [ !c@^! } ÁP^, ÁÖ } \*|æ} áÁÖ@æ } c^!Á [-CE•• [ &ÉÁ [-ÁÜ@^•á&æ|ÁU|æ } cÁCEá { á } á•c!æc [ !•Á { ^cá } \* 8YjY'cd a Ybh'cZ' @UbXgWUdY=DA' kYVdU [ Y

ÁÁÁÁ'ÁÁ@cc ] KDD, , É~ç { É^á~Dd^ } c|æàDŠæ } á•&æ } ^ÁG€QÚTĐŠæ } á•&æ } ^QÚTÉ@c { | AUghYf' ; UfXYbYf' 7c i fgY=DA' @YWh i fYg

ÁÁÁÁ'ÁÁ- 'YjYbhgzÁ ) + 'gh i XYbhg. 'á } Áæ } } ~æ|Á|æ••^•Á [ ] ÁU|æ } c!Öá•^æ•^Áæ } áÁQÚTÉÁP^æ|c@^ÁŠæ, } ÁTæ } æ\*^ { ^ } cÉÁæ } áÁÖ } c [ [ [ [ \* ^ ÁÁÁÁ'ÁÁUç^!ÁÍ !€Á^!cá-á^ÁÁTæ•c^!ÁÖæ!á^ } ^!Áç [ ] ~ } c^!; Áç- [ ! { ^!Á•c^á^ } c•DÁ [ \* \* ^áÁ [ ç^!ÁH€Í€€Á@ [ ~ !•Áá^ &æcá } \*Ác^!Á ] ~ à|á&æà [ ~c @ [ { ^Á^æ!á^ } á } ÉÁ ] ^•cá&áá^!á^ &cá [ ] ÉÁ, æc^!Á ~ æ|áç^ÉÁ•^•cæá } æà|Á|æ } á•&æ } ^•ÉÁ [ &æ|Á- [ [ á ] ! [ á ~ &cá [ ] AUghYf' ; UfXYbYf' <Y'd']bY

ÁÁÁÁ'ÁÁ&+++ ' \c a Y' [ UfXYbYf' e i Ygh]cbg'UbgkYfYX#-DA' ]bZcf a Uh]cb'dfc j]XYX AUghYf' ; UfXYbYf' 5XjUbWYX'HfU]b]b [=DA' KYV]bUfjg

ÁÁÁÁ'ÁÁ\* 'YjYbhgz'%' 'UhhYbXYyg. 'QÚTÁ- [ !ÁY ^^áBÁV~!-ÁTæ } æ\*^ { ^ } cÉÁQÚTÁ- [ !ÁÖ~ } \*æ|ÁÖá•^æ•^Á [-ÁV [ { æc [ ÉÁV; ^^ÁBÁÜ@; ~ áÁÜ^•c æ } áÁÖá•^æ•^ÁY æ|ÁÉÁæ } } ~æ|ÁP^! ] |á } ^ÁV!æá } á } \* AUghYf' ; UfXYbYf' =DA' : UWh\Yfhg

ÁÁÁÁ'ÁÁHÁ-æ&c•@^c•KÁV [ { æc [ ÁU! [ à|^ { •Áá } Ác@^ÁP [ { ^ÁÖæ!á^ } ÉÁQá^ } cã-á&æcá [ ] ÁBÁTæ } æ\*^ { ^ } cÁ [-ÁY @æc^ÁÖ; ~ à•Áá } ÁX^! { [ ] c!• Ö!^^ } •&æ } ^•ÉÁTæ } |ÁU! [ à|^ { •Á@cc ] •KDD, , É~ç { É^á~D^c^ } •á [ ] D { æ•c^! \*æ!á^ } ^!D \*æ!á^ } á } \*É!^• [ ~!&^• D'Ubh' 8]U [ bcgh]W' 7` ]b]W' X]gYUgY#]bgYWh#kYXX'X]U [ bcgh]Wg

ÁÁÁÁ'ÁÁ%\$\* ) 'gU a d'Yg'dfcWYggYX. 'áææ\* } [ •á•DQÚTÁá } - [ ! { æcá [ ] Á ] ! [ çáá^áÁc [ Á& [ { { ^!&æ|Á\*! [ ], ^!•ÉÁTæ•c^!ÁÖæ!á^ } ^!•ÉÁ^\*^ } ^!æ ] ~ à|á& D'Ubh' 8]U [ bcgh]W' 7` ]b]W' HUf [ YhYX'ghU\_Y\c`XYf' [ fc i dg

ÁÁÁÁ'ÁÁCEáç^!; cã•^áç [ ÁXVÁV; ^^ÁÖ; ~ áçÁÖ; [ , ^!•ÁCE•• [ &áæcá [ ] Áá } Áæ } } ~æ|Á } ^, •|^cc^!•ÉÁ { ^cá } \* • ÁÁÁÁ'ÁÁCE } } ~æ|Áæ!cá&|^•ÁÁÖ~!^ } cÁÖá•^æ•^ÁQ••^•Áæ } áÁQÚTÁÁá } ÁXVÁB~!•^!^Áæ } áÁŠæ } á•&æ } ^ÁCE•• [ &áæcá [ ] Á } ^, •|^cc^! D'Ubh' 8]U [ bcgh]W' 7` ]b]W' 9 ]hYbg]cb' dfYgYbhUh]cbg#kcf\_g\cdg

ÁÁÁÁ'ÁÁ\* \* 'YjYbhgz'&\$, ) 'UhhYbXYyg. 'á^!áÁ& [ ] Áæ } áÁ- [ !æ\*^Á\*! [ ], ^!•ÉÁVX^TÁÖæ! { ^!ÁV!æá } á } \*ÁU! [ \*!æ { Á•c^á^ } c•ÉÁæÁXVÁÖ!æ ] ^Áæ } á Yá } ^ÁÖ [ ~ } &á|Áæ } } ~æ|Á { ^cá } \*ÉÁXVÁX^•^cæà|Áæ } áÁÖ!^!ÁÖ! [ ], ^!•Áæ•• [ &áæcá [ ] Á { ^cá } \*•ÉÁPÜÖCEXVÁ [ ! \*æ } á&Áæ•• [ &áæcá [ ] { ^cá } \*•ÉÁP^, ÁÖ } \*|æ } áÁX^•^cæà|ÁBÁÖ; ~ áçÁÖ [ ] -^!^ } &^ ÁÁÁÁ'ÁÁGFÁCE& [ ! •Ác@^ÁÖ^ } &^ÁÖc^ } •á [ ] ÁV|Áçá•á [ ] Á ] ! [ \*!æ { •Á [ ] ÁQÚTÁ@cc ] •KDD, , É~ç { É^á~D^c^ } •á [ ] Dæc-^ } &^ ÁÁÁÁ'ÁÁCE } } ~æ|Á& [ ] ~ { } •Á [ ] Á&~!^ } cD^ { ^! \*á } \*Á ] ^•c•Áá } ÁááÉ, ^^!^ÁXVÁX^•^cæà|Áæ } áÁÖ!^!ÁP^, •|^cc^!LÁÍ !€ÁP^, ÁÖ } \*|æ } áÁ\*! [ ], ^!• @cc ] •KDD, , É~ç { É^á~Dççç^\*æ } áá^!^D } ^, •|^cc^!Dáæc^ } æçáæ!É@c { ÁÁÁÁ'ÁÁÜ^\*~ |æ!ÁÁÖ! [ { Ác@^ÁÜ|æ } cÁÖáæ\* } [ •cá&ÁÖ]á } á&ÁÁ& [ ] ~ { } Áá } Á [ ] c@|^ÁXVÁCE^\* } &^Á [-ÁCE^!á&~|c~!^Á } ^, •|^cc^!LÁÍ !€ÁXVÁBÁP^, Ö } \*|æ } áÁ\*! [ ], ^!•ÉÁ& [ ] } æ } á^•ÉÁ~ } áç^!; áçá^•ÉÁæ\*^ } &á^•Á@cc ] KDDæ\*!á&~|c~!^Éç^! { [ ] cÉ\* [ çD ] ^, • { ^ááæDæ\*!áçá^, Á

<c k' \UjY'h\Y'fYg i`hg'VYYb'X]ggY a ]bUhYX'hc'Wc a a i b]h]Yg'cZ UdYg VYYb bcBY'bYk

Final Report

.....5WWYgg]cb'Bc''%\$\$(- -, .....Dfc^YWh'Bc''JHB&-&\$\$

]@[]^&æ||•ÉÁ^ { æä|•ÉÁ-æ&c•@^c•ÉÁ , ^à•äc^•ÉÁæ } äÁ• [ &ææ]Ä { ^äææÉ
ÄÄÄÄ'ÄÄÜTÄä }~ [ ! { æcä [ ] Ää•Ää^jç^!^äÄc@! [ ~ \* @Äc@^ÄWXTÄTæ•c^!ÄÖæ:ä^ } ^!Ä& [ ~ !•^ÉÄc@! [ ~ \* @Äc@^ÄWXTÄTæ•c^!ÄÖæ:ä^ } ^!ÄP^| ] jä } ^É
c@! [ ~ \* @Ä-æ&c•@^c•ÉÁæ } äÁ•cæc^ , ää^Ä ] ! [ b^&c•É
ÄÄÄÄ'ÄÄÜjæ } cÄÖææ \* } [ •cä&ÄÖjæ } ä&ÄÜTÄä }~ [ ! { æcä [ ] Ää•Ää•c!äa~c^äÄc@! [ ~ \* @Ä•æ { ] | ^Ääææ \* } [ •ä•ÉÄ , ^à•äc^•ÉÁ } ^ , •|cc^!•ÉÄc^!^çä•ä [ ] É
] | ^•^• } cæcä [ ] •ÉÄ , [ ! \ • @ [ ] •ÉÁ^ { æä|•ÉÁæ } äÁ ] @ [ ] ^&æ||•É

K\Uh'Xc'mc i 'd'Ub'hc'Xc'X i f]b [ 'h\Y'bYIh'fYdcfh]b [ 'dYf]cX'hc'UWWc a d]g \ 'h\Y' [ cU'g3
, P [ c@a ] \* Äc [ Ä!^ ] [ !cä

DUfh]W]dUbhg

5Wh i U' : H9dg'Zcf'h\]g'FYdcfh]b [ 'DYf]cX

Fc`Y	Bcb!Gh i XYbhg`cf ZUW i`hm	Gh i XYbhg`k]h\`GhUZZ]b [ `Fc`Yg			7c a d i hYX`HchU` Vm`Fc`Y
		I bXYf [ fUX i UhY	; fUX i UhY	Dcgh!8cWhcfUhY	
Scientist	0.4	0	0	0	0.4
Professional	0.3	0	0	0	0.3
Technical	0.5	0	0	0	0.5
Administrative	0.3	0	0	0	0.3
Other	0	0	0	0	0
Ö [ { } ~ c^ÄÄV [ cæ]	1.5	0	0	0	1.5

Gh i XYbh'7 c i bh'Vm'7`Ugg]Z]WU]cb'cZ'-bgfh i Wh]cbU`Dfc [ fU a g'fl7-DL'7 cXY

, P U Ä Ö C E V C E Ä Ö B V Ö Ü Ö Ö

HUf [Yh'5 i X]YbWY

Væ! ^\*cÄæ ~ ää^ } &^Ää } &| ~ ä^Ä [ { { ^!&ææ]Äæ \* !ä& ~ !c~ !æ]Ä [ ] ^!æc [ !•Äæ } äÄæ•• [ &æc^äÄä } ä ~ c!^Ä• ~ @Äæ•Ä&! [ ] Ä& [ ] •~ |cæ } c•ÉÄ ] ! [ ~^••ä [ ] æ ] ^•cÄ { æ } æ^!•ÉÄ^çc^ } ä [ ] Ä^ä ~ &æc [ !•ÉÄ!^•^æ!&@^!•Äæ } äÄ•ä { ä]æ!Ä•cæ\^@ [ |ä^!•ÉÄÄÖ [ { { ^!&ææ]Ä [ ] ^!æc [ !•Ää } &| ~ ä^Ä } ^ , Äæ } ä ^•cæä]ä@^ä^!æä]dä!^Ä^æ } d@ [ ] Ä-æ! { ^!•ÉÄæ } ] | ^Ä \* ! [ , ^!•ÉÄ \* !æ ] ^Ä \* ! [ , ^!•ÉÄ \* !^ } @ [ ~^•^Ä [ ! ] } æ { ^ } cæ ] d& ~ cÄ- [ , ^!•Dç^\*^cæä] ^ \* ! [ , ^!•ÉÄ]æ } ä•&æ ] ^d ] ^!^ } äæ]d } ~ !•^!^Ä•c [ &\Ä \* ! [ , ^!•ÉÄ]æ } ä•&æ ] ^Ä { æ } æ^!•d \* ! [ ~ } ä•\^ } ^!•ÉÄæ } äÄ ] ! [ ä~&cÄ^ } äÉ ~^•!•Ä• ~ &@Äæ ä!^ , ^!•ÉÄäæ\^!•ÉÄ [ Ä { ä] ^!•ÉÄÄ Tæ•c^!ÄÖæ:ä^ } ^!•ÉÄ@ [ { ^!•æ!ä^ } ^!•ÉÄ \* ^ } ^!æ]Ä ] ~ ä]ä&Ä&@ [ [ !•Äæ } äÄ& [ { { ~ } äcä^•Äæ!^Äæ ] • [ Äcæ!^cæ æ ~ ää^ } &^Ä- [ Ä ] [ !cä [ ] •Ä [-Äc@ä•Ä ] ! [ b^&c

DfcX i Whg

HmdY GhUhi g MYUf'D i V]g\YX B=: 5`G i ddcfh'5W\_bc k`YX [YX
Websites Published 2018 YES

7]hUh]cb

Bradshaw, T., Kingsley-Richards, S. UVM Fruit Grape Website:
http://www.uvm.edu/~fruit/?Page=grapes/gr\_home.html&SM=gr\_submenu.html

HmdY GhUhi g MYUf'D i V]g\YX B=: 5`G i ddcfh'5W\_bc k`YX [YX
Websites Published 2018 YES

7]hUh]cb

Bradshaw, T., Kingsley-Richards, S. UVM Fruit Tree Fruit Website:
http://www.uvm.edu/~fruit/?Page=treefruit/tf\_home.html&SM=tf\_submenu.html

## Final Report

.....5WWYgg]cb`Bc"%"\$\$(- -, .....Dfc^YWh`Bc" JHB&-&\$\$
---

<b>HmdY</b>	<b>GhUhi g</b>	<b>MYUf`DiV`]g\YX</b>	<b>B=: 5`Gi ddcfh`5W_bck`YX[YX</b>
Other	Published	2017	YES

**7]hUh]cb**

Bradshaw, Terence. Non-Chemical Weed Management in Apple Orchards, ASHS HortIM, accessed July 12, 2017, <http://hortim.ashsmedia.org/items/show/52>

<b>HmdY</b>	<b>GhUhi g</b>	<b>MYUf`DiV`]g\YX</b>	<b>B=: 5`Gi ddcfh`5W_bck`YX[YX</b>
Other	Published	2017	YES

**7]hUh]cb**

Bradshaw, Terence and Lorraine P. Berkett, 2017. An Initial IPM Strategy for New Cold Climate Winegrape Growers, ASHS HortIM, <http://hortim.ashsmedia.org/items/show/48>

<b>HmdY</b>	<b>GhUhi g</b>	<b>MYUf`DiV`]g\YX</b>	<b>B=: 5`Gi ddcfh`5W_bck`YX[YX</b>
Other	Published	2017	YES

**7]hUh]cb**

Bradshaw, Terence and Lorraine P. Berkett, 2017. Relative Disease Ratings for Wine Grape Varieties Grown in Vermont, ASHS HortIM, <http://hortim.ashsmedia.org/items/show/49>

<b>HmdY</b>	<b>GhUhi g</b>	<b>MYUf`DiV`]g\YX</b>	<b>B=: 5`Gi ddcfh`5W_bck`YX[YX</b>
Journal Articles	Published	2016	YES

**7]hUh]cb**

Bradshaw, T.L., Berkett, L.P., Moran, R.E., Garcia, M.E., Darby, H.M., Parsons, R.L., Kingsley-Richards, S.L., Griffith, M.C., Bosworth, S.C. and Görres, J.H. 2016. Disease and arthropod pest incidence in two organic apple orchard systems in Vermont, USA, 2008-2013. *Acta Hort.* 1137, 129-136.

<b>HmdY</b>	<b>GhUhi g</b>	<b>MYUf`DiV`]g\YX</b>	<b>B=: 5`Gi ddcfh`5W_bck`YX[YX</b>
Journal Articles	Published	2018	NO

**7]hUh]cb**

Bradshaw, T.L., Hazelrigg, A.L. and Berkett, L.P. 2018. Characteristics of the cold-climate winegrape industry in Vermont, USA. *Acta Hort.* 1205, 469-476.

<b>HmdY</b>	<b>GhUhi g</b>	<b>MYUf`DiV`]g\YX</b>	<b>B=: 5`Gi ddcfh`5W_bck`YX[YX</b>
Journal Articles	Published	2016	YES

**7]hUh]cb**

Bradshaw, T.L., Hazelrigg, A., Kingsley-Richards S.L., and Foster, J.A. 2016. Biological disease management of Vf-gene scab resistant organic apples, 2015. *Plant Dis. Manag. Rep.* 10:PF032.

<b>HmdY</b>	<b>GhUhi g</b>	<b>MYUf`DiV`]g\YX</b>	<b>B=: 5`Gi ddcfh`5W_bck`YX[YX</b>
Journal Articles	Published	2016	YES

**7]hUh]cb**

Bradshaw, T.L., Hazelrigg, A., Kingsley-Richards S.L., and Foster, J.A. 2016. Field assessment of salicylic acid to aid in reduction of sulfur to manage apple scab. *Plant Dis. Manag. Rep.* 10:PF031.



United States Department of Agriculture  
**Final Report**

## Final Report

.....5WWYgg]cb`Bc"%%\$\$( -- , .....Dfc^YWh`Bc" JHB&-&\$&
---

HmdY	GhUhi g	MYUf`DiV`]g\YX	B=: 5`Gi ddcfh`5W_bck`YX[YX
Journal Articles	Published	2018	NO

**7]hUh]cb**

Hazelrigg, A.L., Bradshaw, T.L., Maia, G.S., Kingsley-Richards, S.L. and Berkett, L.P. 2018. Disease susceptibility of cold-climate grapes in Vermont, USA. *Acta Hortic.* 1205, 477-482.

HmdY	GhUhi g	MYUf`DiV`]g\YX	B=: 5`Gi ddcfh`5W_bck`YX[YX
Journal Articles	Published	2014	NO

**7]hUh]cb**

Noel, Z.A., Bradshaw, T.L., Kingsley-Richards, S.L., and L.P. Berkett. 2014. Evaluation of the efficacy of natural resistance in 'Honeycrisp' to reduce fungicide applications for *Venturia inaequalis*, 2012-2013. *Plant Disease Management Reports* 9:PF004.

HmdY	GhUhi g	MYUf`DiV`]g\YX	B=: 5`Gi ddcfh`5W_bck`YX[YX
Other	Published	2014	NO

**7]hUh]cb**

Parker, B.L., Skinner, M., Tobi, D. and Wanderlich S. 2014. General facts about conifer root aphids and management considerations. UVM Entomology Research Lab., Burlington. <https://cdn.sare.org/wp-content/uploads/20171204120041/GeneralFactsaboutConiferRootAphid.pdf>

HmdY	GhUhi g	MYUf`DiV`]g\YX	B=: 5`Gi ddcfh`5W_bck`YX[YX
Other	Published	2015	NO

**7]hUh]cb**

Parker, B.L., D. Tobi, D., Wanderlich, S. and Skinner, M. 2015. Biological Control of Conifer Root Aphids in Christmas Trees: An Update. UVM Entomology Research Lab., Burlington. <https://cdn.sare.org/wp-content/uploads/20171204115943/BiologicalControlofConiferRootAphidDraft.pdf>

HmdY	GhUhi g	MYUf`DiV`]g\YX	B=: 5`Gi ddcfh`5W_bck`YX[YX
Journal Articles	Published	2016	NO

**7]hUh]cb**

Smith, Richard G., Sonja K. Birthisel, Sidney C. Bosworth, Bryan Brown, Thomas M. Davis, Eric R. Gallandt, Ann Hazelrigg, Eric Venturini, and Nicholas D. Warren. 2016. Environmental correlates with germinable weed seed banks on organic farms across northern New England. *Weed Science*, 66(1), 78-93.

HmdY	GhUhi g	MYUf`DiV`]g\YX	B=: 5`Gi ddcfh`5W_bck`YX[YX
Websites	Published	2018	YES

**7]hUh]cb**

Sullivan, C.E.F. and Skinner, M. Greenhouse Integrated Pest Management Website: <http://www.uvm.edu/~entlab/Greenhouse%20IPM/UVMGreenhouseIPM.html>

HmdY	GhUhi g	MYUf`DiV`]g\YX	B=: 5`Gi ddcfh`5W_bck`YX[YX
Websites	Published	2018	YES

**7]hUh]cb**

Sullivan, C.E.F. and Skinner, M. Landscape Integrated Pest Management Website: <http://www.uvm.edu/~entlab/Landscape%20IPM/LandscapeIPM.html>

Final Report

.....5WWYgg]cb`Bc"%"\$\$(- -, .....Dfc^YWh`Bc" JHB&-&\$\$

<b>HmdY</b>	<b>GhUhi g</b>	<b>MYUf`DiV`]g\YX</b>	<b>B:- 5`Gi ddcfhi`5W_bck`YX[YX</b>
Websites	Published	2017	YES

**7]hUh]cb**

Twilight meeting focuses on fertility and weed control in apples. Country Folks New England. 4/28/2017.  
<http://countryfolks.com/twilight-meeting-focuses-on-fertility-and-weed-control-in-apples/>

**Ch\Yf`DfcXi Whg**

**DfcXi Wh`HmdY**

Other

**8YgWf]dh]cb**

Agronomy Field Days highlighting grain, oilseed, and hops pest management trials, scouting strategies, and pest identification tools.

**DfcXi Wh`HmdY**

Other

**8YgWf]dh]cb**

Agronomy Winter Conferences on pests, diseases, weeds and IPM specific to grain, oilseed, and hops. Webinars streamed live from each event.

**DfcXi Wh`HmdY**

Audio or Video

**8YgWf]dh]cb**

Agronomy Web Resources: website, blogs, YouTube videos, pest management information briefs

**DfcXi Wh`HmdY**

Data and Research Material

**8YgWf]dh]cb**

Grain Disease Survey: survey New England farms for foliar disease.

**DfcXi Wh`HmdY**

Data and Research Material

**8YgWf]dh]cb**

Loose Smut Seed Lot Testing. Farmers sent results and info on how to reduce loose smut in fields and seed lots.

**DfcXi Wh`HmdY**

Educational Aids or Curricula

**8YgWf]dh]cb**

Guides of Pests in New England for oilseeds, grains, and hops including pest id, lifecycle and management tools.

.....5WWYgg]cb`Bc"%\$\$ ( -- , .....Dfc^YWh`Bc" JHB&-&\$\$

**DfcX i Wh`HmdY**

Other

**8YgWf]dh]cb**

Apple Extension, Outreach, Education: newsletters, blog posts, and/or factsheets containing time- and crop-sensitive IPM information integrating weather and pest models, on-farm workshop to demonstrate IPM practices, one-on-one consultations, revisions of the New England Tree Fruit Management Guide, planning and presentations at regional grower meetings.

**DfcX i Wh`HmdY**

Educational Aids or Curricula

**8YgWf]dh]cb**

Apple IPM Guideline Assessment: selected group of advisory stakeholders participated in a survey of crop-specific IPM practices practiced in their orchard operation.

**DfcX i Wh`HmdY**

Other

**8YgWf]dh]cb**

Grape Extension, Outreach, Education: newsletters, blog posts, and/or factsheets containing time- and crop-sensitive IPM information integrating weather and pest models, on-farm workshop to demonstrate IPM practices, one-on-one consultations, planning and presentations at regional grower meetings.

**DfcX i Wh`HmdY**

Educational Aids or Curricula

**8YgWf]dh]cb**

Grape IPM Guideline Assessment: selected group of advisory stakeholders participated in a survey of crop-specific IPM practices practiced in their vineyard operation.

**DfcX i Wh`HmdY**

Educational Aids or Curricula

**8YgWf]dh]cb**

IPM First for Greenhouse Ornamentals: a statewide individualized grower program. UVM personnel visited each grower to provide one-on-one instruction and support on selecting, adopting and using plant-mediated IPM systems.

**DfcX i Wh`HmdY**

Other

**8YgWf]dh]cb**

Tri-State Greenhouse IPM Workshops: hands-on IPM demonstrations and IPM information packets.

**DfcX i Wh`HmdY**

Educational Aids or Curricula

**8YgWf]dh]cb**

Green Industry IPM ambassadors: a statewide individualized landscape/nursery industry stakeholder program. UVM personnel visited each stakeholder to provide one-on-one instruction and support on selecting, adopting and using plant-mediated IPM systems. Stakeholders will subsequently assist with promoting IPM to other growers.

.....5WYyg]cb`Bc"%"\$\$(- -, .....Dfc^YWh`Bc" JHB&-&\$\$

**DfcX i Wh`HmdY**

Other

**8YgWf]dh]cb**

Regional IPM Workshops for Landscapers: hands-on IPM demonstrations and IPM information packets. Presentations also given at Green Industry association meetings.

**DfcX i Wh`HmdY**

Educational Aids or Curricula

**8YgWf]dh]cb**

Landscape IPM webpage and brochure: Development of Landscape IPM webpage and Landscape IPM Brochure.

**DfcX i Wh`HmdY**

Educational Aids or Curricula

**8YgWf]dh]cb**

Master Gardener Course IPM Lectures: a 13 week course with 200 students including three lectures on IPM topics.

**DfcX i Wh`HmdY**

Other

**8YgWf]dh]cb**

Master Gardener Helpline: a popular statewide toll-free source for gardeners needing information on current insect, weed and diseases

**DfcX i Wh`HmdY**

Educational Aids or Curricula

**8YgWf]dh]cb**

Master Gardener Advanced Training IPM Webinars: part of the training for the MG volunteers in advanced IPM concepts and emerging insect, weed and disease problems.

**DfcX i Wh`HmdY**

Educational Aids or Curricula

**8YgWf]dh]cb**

Master Gardener IPM Factsheets: developed by subject matter specialists and made available to the public on the Master Gardener website, and provided for MG information tables at fairs and farmer's markets.

**DfcX i Wh`HmdY**

Other

**8YgWf]dh]cb**

Plant Diagnostic Clinic disease/insect/weed diagnostics: diagnosis and IPM recommendations. Clients include commercial growers (agronomic, apple, grape, greenhouse, landscape, nursery, vegetable, berry, etc.), Master Gardener Helpline, the gardening public and urban consumers.

**DfcX i Wh`HmdY**

Other

**8YgWf]dh]cb**

Targeted stakeholder groups: apple growers, grape growers, and landscapers targeted through presentations and grower listservs to make them aware of the Plant Diagnostic Clinic's services.

.....5WWYgg]cb`Bc"%"\$\$ ( - - , .....Dfc^YWh`Bc" JHB&-&\$&

DfcX i Wh`HmdY

Other

8YgWf]dh]cb

Plant Diagnostic Clinic Extension presentations/workshops: addressing current and emerging insect, weed and diseases using IPM tactics in commercial crops, for the vegetable and small fruit growers, and for Master Gardeners. Also information on insect, weed and disease outbreaks, id and IPM management strategies provided for MG volunteers, home gardeners and urban consumers through television, factsheets, listservs, MG blogs, websites, webinars, articles and newsletters.

7\Ub[Yg#DfcV`Yag

.....ÁÁÁÁ~ÁÁÁÖ!æä}ÁÖä•^æ•^ÁÜ~!ç^~ÁÁ , æ•Á^ç]æ}á^áÁc[Áá}&|~á^Á•&[~cá}\*Á-[!Áæ!c@!][!ÁÁ]^••Áæ}áÁá[ , }^Á{á|á^ , Á•^ç^!ác~Áá}Áæ||Á@ [ ]  
c!áæ|•ÁæÁc@^ÁcE|á~!\*@ÉÁXVÁ!^•^æ!&@Á-æ!{Áá}Áæááááá[ ]Ác[Á}á}^Á[c@^!Á-æ!{•É  
.....ÁÁÁÁ~ÁÁÁÖ!æ}^ÁÖç^}•á[ ]ÉÁÜ~c!^æ&@ÉÁÖá~&æcá[ ]ÁÁ [ ]!c~}áçá^•Á , ^!^Á\*!^æc|^Á!^á~&^áÁá^Ááá•&[ ]cá}~æcá[ ]Á[-Ác@^ÁX^!{ [ ]cÁÖ!æ}^ÁB  
Yá}^ÁÖ [ ]&á|áæ} }~æ|Á { ^cá} \*•Áá}ÁGÉFÎÉ  
.....ÁÁÁÁ~ÁÁÁQÜTÁÖ!æ}•cÁ-[!ÁÖ!^Á}@[ ]~•^ÁU!}æ{^}çæ|•ÁÁæ}áÁÁÖ!^Á}ÁQ}á~•c!^ÁQÜTÁæ{áæ••æá[!•ÁÁ}~{á^!Á[-Á!^&!~ác•Á , æ•Á!^á~&^áÁæ}á  
•ác^•Á|á{ác^áÁ}!á{æ!á|^Ác[ÁP[!c@ , ^•c^!}ÁXVÁá~^Ác[Á!^á~&^áÁ~}áá}\*É  
.....ÁÁÁÁ~ÁÁÁU|}^Á [ ]^ÁÁÜ^\*á [ ]æ|ÁQÜTÁY [!•@ [ ]Á-[!ÁŠæ}á•&æ|^!•ÁÁ , æ•Á[-~!^áÁçá}ÁXVDÁá~^Ác[Á!^á~&^áÁ~}áá}\*KÁŠæ}á•&æ|^Ác[ ]á&•  
^!^Áá}&|^ááá}Ác@^ÁGÉFÎÁÁV!áÉÜcæc^ÁÖ!^Á}@[ ]~•^ÁQÜTÁY [!•@ [ ]•ÁÁ}ÁTÖÉÁPÁæ}áÁXVÉ  
.....ÁÁÁÁ~ÁÁÁV@^ÁÁŠæ}á•&æ|^ÁQÜTÁÜc^!}á}\*ÁÖ [ { ácc^ÁÁ , æ•Á} [cÁ^•cæà|á•^Ááá~^Ác[Á!^á~&^áÁ~}áá}\*É  
.....ÁÁÁÁ~ÁÁÁV@^ÁÁTæ•c^!ÁÖæ!á^}^!ÁÖ [ ]~•^ÁÁ , áç&@^ÁÁc[Áæ}Á [ ]á}^Á , ^áá}æ!Á-[!{æç•cæ!cá}\*Áá}ÁGÉFÎÁá~^Ác[Ác@^Á][••Á[-Ác@^ÁFFÁXV  
á}c!^æ!æcáç^Ác^!çá•á [ ]Á-æ&á|áçá•ÉÁFÉÉÁÁ[-Á•c~á^}c•Á-[ ]áÁc@^Á}^ , Ác^&@ [ ] [ ]^Ác[Áá^Á~^&cáç^Á- [!Ác@^Á& [ ]~!•É  
.....ÁÁÁÁ~ÁÁÁEÁ&@æ} \*^Á[-ÁTæ•c^!ÁÖæ!á^}^!Á& [ ]!áá}æc[!Áá}ÁGÉFÎÁ!^•|c^áÁá}ÁÁ [ ]c@•Á , áç@[ ]~cÁæá~||Áçá{^Á& [ ]!áá}æc[!É  
.....ÁÁÁÁ~ÁÁÁTæ•c^!ÁÖæ!á^}^!ÁQÜTÁÖæ&c@^Ác•ÁÁ [ ]Á , ^Áá•Áá}Á|æ , }•Á , æ•Á} [cÁ]!á~&^ÁÁæÁ-æ&c@^ÁcÁ [ ]Á {æ}^Á}!á|{ •Á , æ•Á}!á~&^ÁÉ  
.....ÁÁÁÁ~ÁÁÁP[Á&@æ} \*^•@]!á|{ •Á[-Á} [c^Á- [!Á [c@^!Á]! [!^&cÁ]! [ ]\*!æ { •É