

2016 Wild Blueberry Pest Management Update



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Augusta Trade Show, January 14, 2016

Introduction – Red sorrel & horseweed

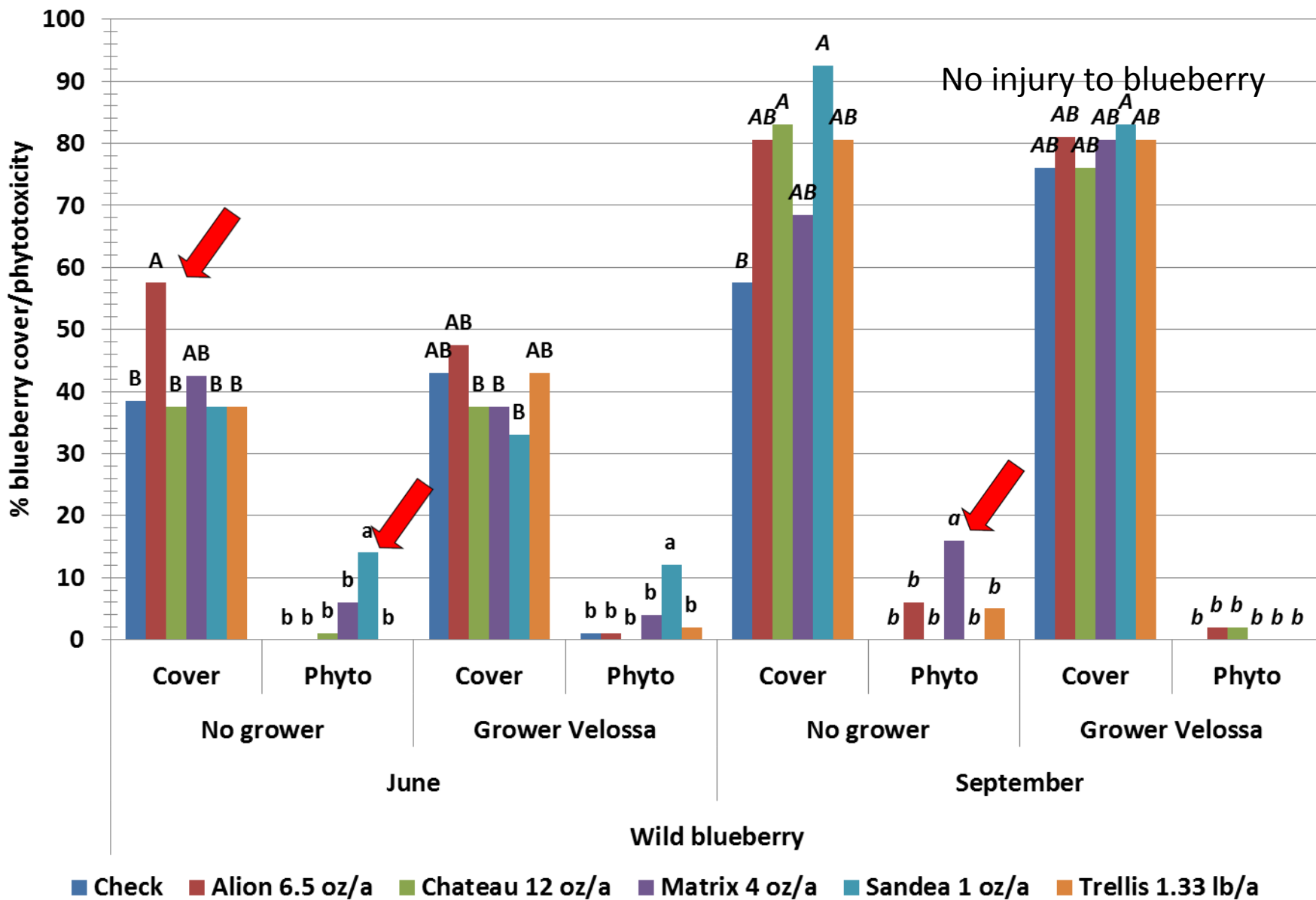
- Several herbicides, both registered and unregistered, are currently under review for use on wild blueberry
- All are pre-emergence herbicides except for Matrix which may be used pre- or post-emergence
- Application timings are being refined due to blueberry phytotoxicity after late pre-emergence applications
- Effects on emerging and problem weed species such as red sorrel (*Rumex acetosella*) and horseweed (*Conyza canadensis*) are currently being tested
- Combinations with Velpar and Sinbar are also needed and are being tested for efficacy and phytotoxicity

Methods – Red sorrel

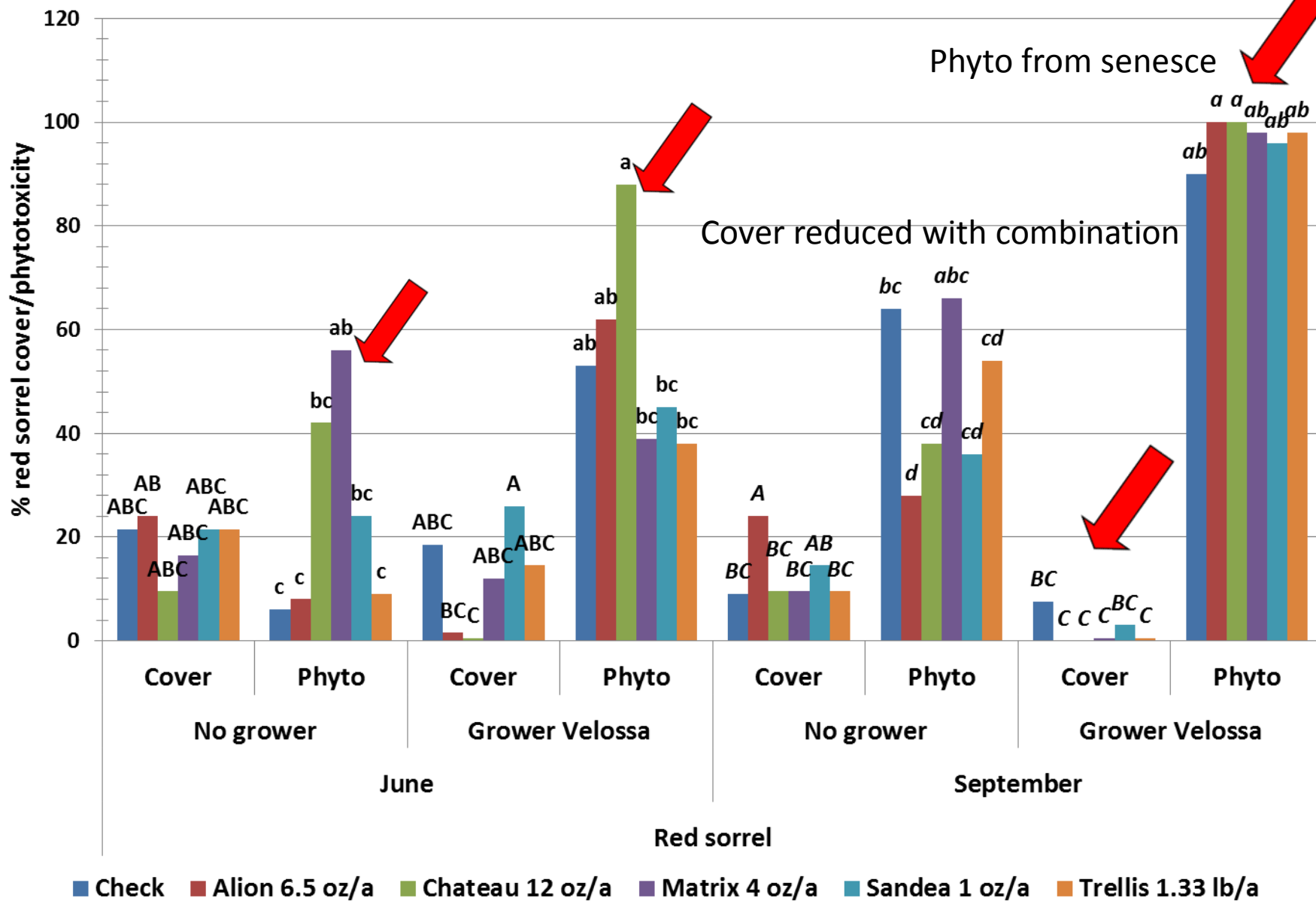
- Red sorrel (*Rumex acetosella*), Jonesboro, ME
 - Resistant to many herbicides/ competes with blueberry and plants hinder harvest/ tends to colonize bare spots so may compete with blueberry rhizome establishment
 - Ten 1-m² plots per treatment, sprayed 14 May 2015; with five sprayed with Velossa 0.4 gal/a also on 14 May by grower
 - Check
 - Alion 6.5 oz/a
 - Chateau 12 oz/a
 - Matrix 4 oz/a
 - Sandea 1 oz/a
 - Trellis 1.33 lb/a
 - Wild blueberry, broadleaf weed, grass and red sorrel covers, and blueberry and red sorrel phytotoxicity, assessed 10 June & 1 Sept
 - Treatment differences analyzed using Tukey's test ($\alpha=0.05$)



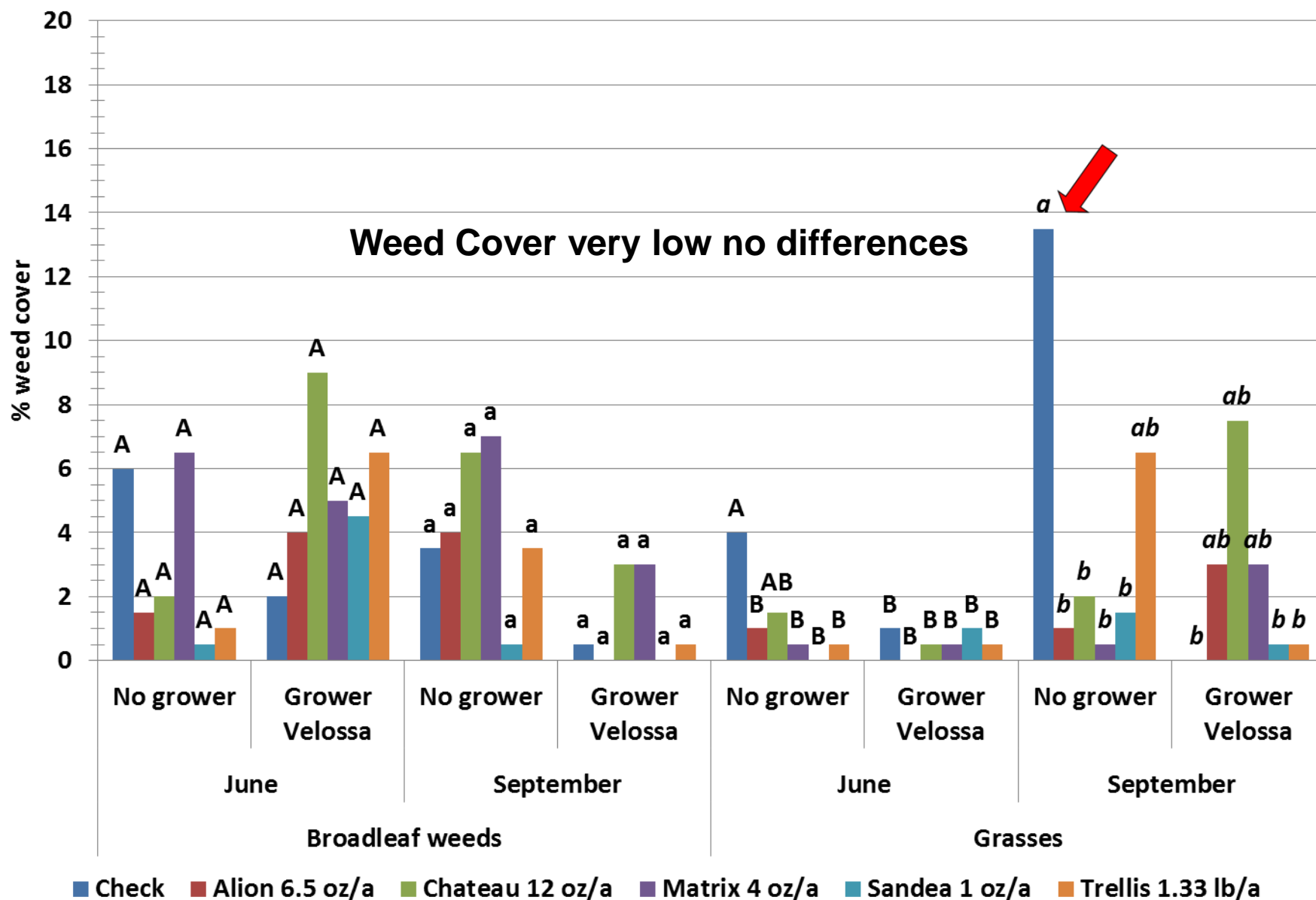
2015 red sorrel trial - wild blueberry cover and phytotoxicity



2015 red sorrel trial - red sorrel cover and phytotoxicity



2015 red sorrel trial - broadleaf weed and grass cover



Results – Red sorrel

- No significant differences in blueberry cover at either evaluation
- Phyto was initially highest in the Sandea treatments and was higher than all other treatments except Matrix alone
- Initially no significant differences in red sorrel cover
 - In September, red sorrel cover remained similar in the treatments alone but was almost eliminated in the grower Velossa treatment
 - Overall RS injury was greater in the grower Velossa treatment
 - Alion and Chateau most effective with Velossa
 - Matrix most effective alone
 - In some plots red sorrel was set back but recovering at first evaluation; but at 2nd evaluation most red sorrel was senescing
- Broadleaf weeds and grasses were low overall, <14%, with no significant differences at either treatment



The check in September, showing green and senescing red sorrel



The Alion treatment alone in September with higher RS cover than check



Alion and Chateau (shown) + hexazinone eliminated RS by September



However, the grower treatment also eliminated RS by September

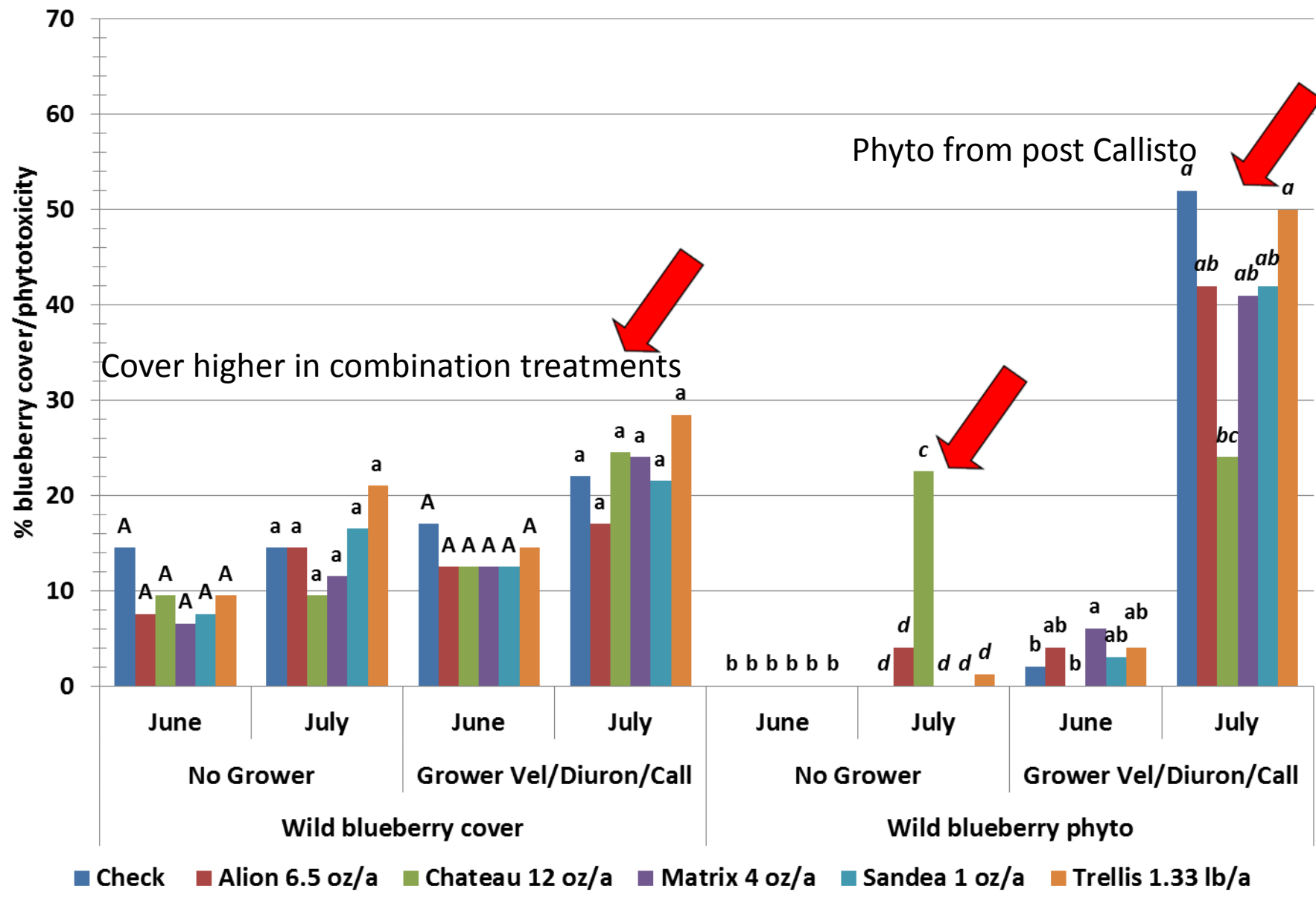
Methods – Horseweed

- Horseweed (*Conyza canadensis*) trial, T-32, ME
 - Biennial and overwinters as basal rosette so effect of registered herbicides not known, also colonizes bare spots
 - Ten 1-m² plots per treatment, sprayed **11 Nov 2014**; five with grower Velossa 6.6 pt/a + Diuron 1.6 qt/a on **12 May 2015** and Callisto 3 oz/a + COC 25.6 oz/a on 16 June
 - Check
 - Alion 6.5 oz/a
 - Chateau 12 oz/a (late addition, sprayed 11/26/14)
 - Matrix 4 oz/a
 - Sandea 1 oz/a
 - Trellis 1.33 lb/a
 - Wild blueberry, broadleaf weeds, grasses and horseweed cover, and blueberry phytotoxicity evaluated on 4 June and 9 July
 - Horseweed phyto not assessed because it was either dead or unaffected only, evaluated early and pulled plants to prevent going to seed
 - Treatment differences analyzed using Tukey's test ($\alpha=0.05$)



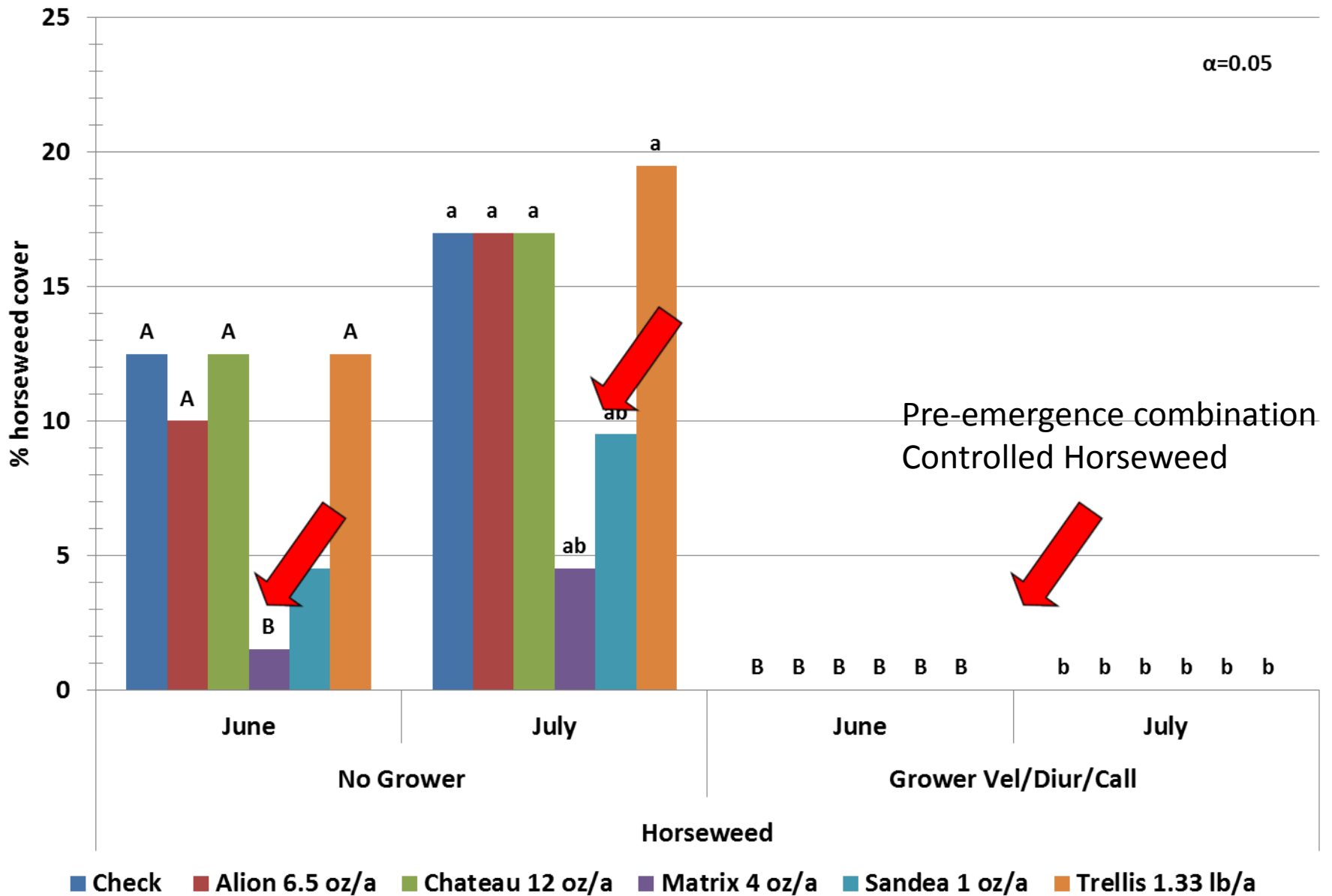


2015 horseweed trial - wild blueberry cover and phytotoxicity



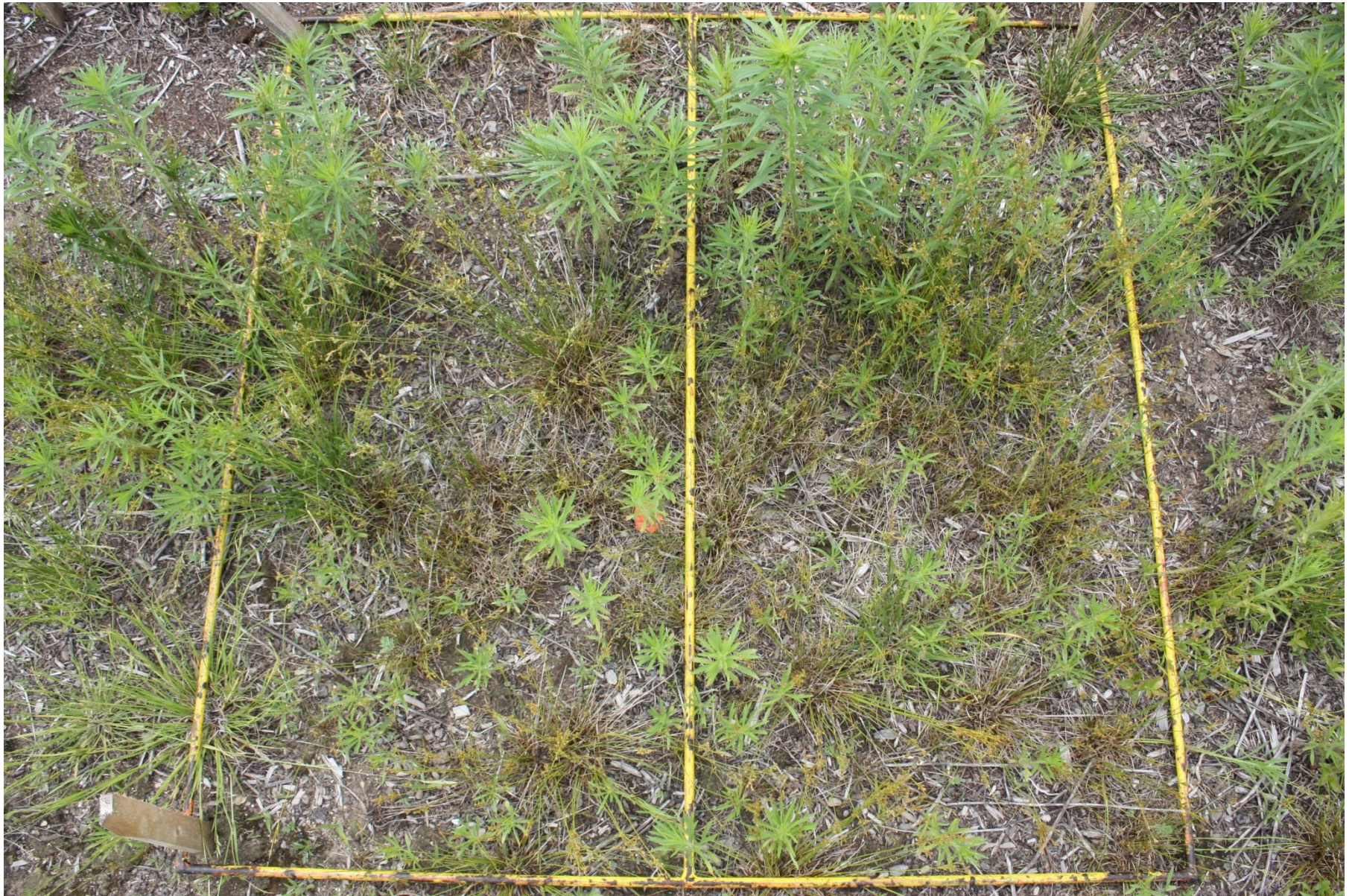
2015 horseweed trial - horseweed cover and phytotoxicity

$\alpha=0.05$



Results – Horseweed

- No significant differences in wild blueberry at either evaluation
 - Blueberry cover low overall because horseweed occurred in bare spots
- Blueberry injury in treatments alone was low overall, except for phyto in Chateau alone
 - Phyto in the grower-treated plots was initially low but very high in July due to the grower's application of Callisto on a hot day between the 1st and 2nd evaluation
- There was no horseweed in any of the plots sprayed with Velossa/Diuron at either evaluation (callisto did add to effectiveness)
 - **When used alone, Matrix was most effective** on horseweed at both evaluations, but only significantly so in June
 - All other treatments were not different from the untreated check



July – untreated check



July – Matrix trt, note HW control and HW outside plot



July –Chateau trt, note lack of HW control and BB phyto (in red)



July – Grower check, note lower leaf loss and chlorosis from Callisto

Introduction - Dogbane

- Spreading dogbane (*Apocynum androsaemifolium*) is a major weed pest in wild blueberry fields
- It is difficult to control with many of the industry's standard herbicides
- In spring 2015 we initiated a trial to examine the effect of Callisto (mesotrione) and Matrix (rimsulfuron), and combinations , on dogbane control

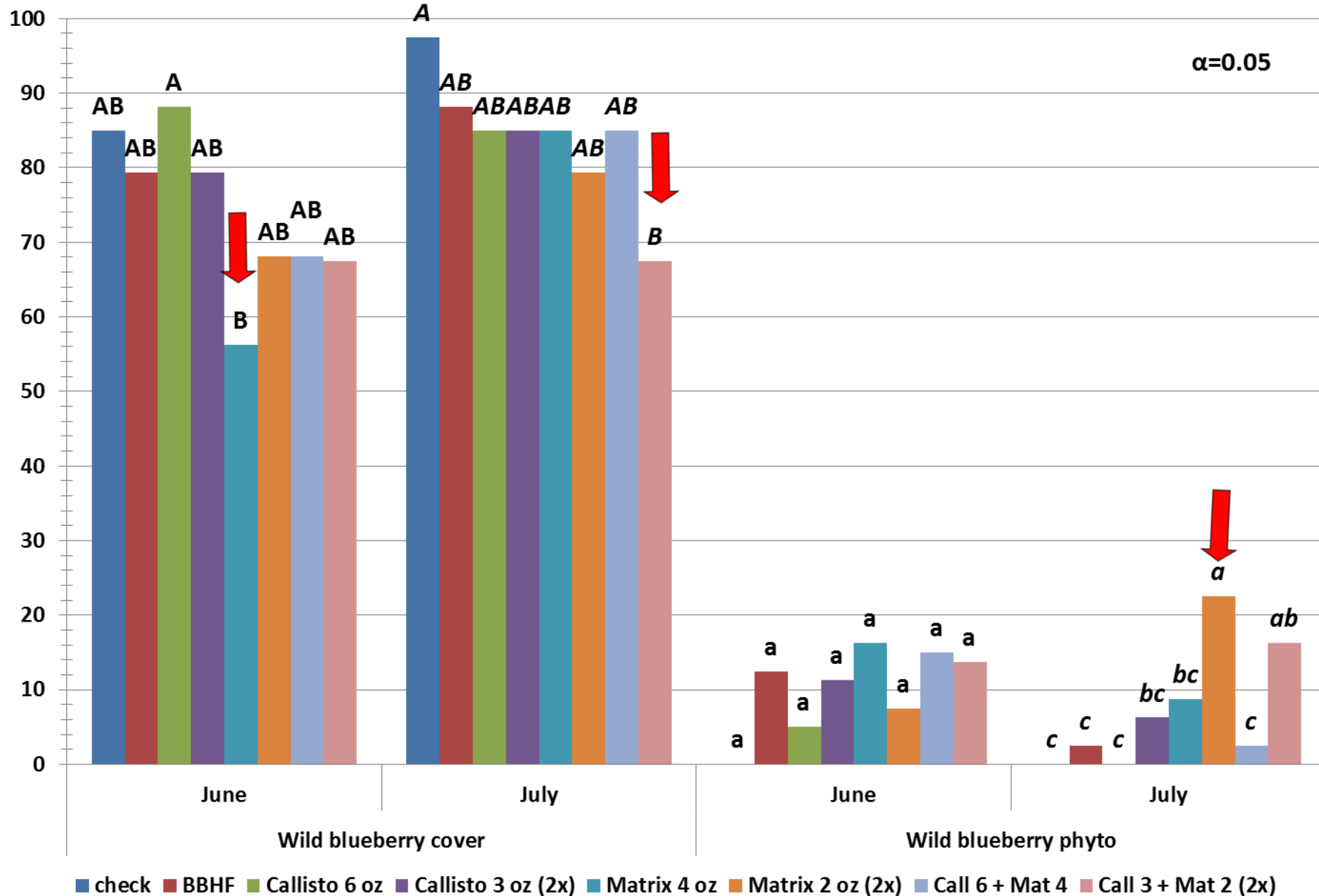
Methods - Dogbane

- Trial site was at Blueberry Hill Farm in a prune year field
- Four 1 x 2 m plots per treatment, sprayed post-emergence once (6/3) or twice as split application (6/3 & 6/17)
 - Untreated check
 - BHF: **Velpar 2 lb/a+Sinbar 2 lb/a+Diuron 1.6 qt/a on 5/13 and Callisto 6 oz/a+clethodim 6 oz/a on 5/27**
 - Callisto 6 oz/a
 - Matrix 4 oz/a
 - Callisto 6 oz/a + Matrix 4 oz/a
 - Callisto 3 oz/a (2x)
 - Matrix 2 oz/a (2x)
 - Callisto 3 oz/a + Matrix 2 oz/a (2x)
- Blueberry and dogbane cover and phyto, and other broadleaf weed and grass cover evaluated on 6/17 just prior to 2nd herbicide application, and 7/2
- All treatments compared using Tukey's test ($\alpha=0.05$)

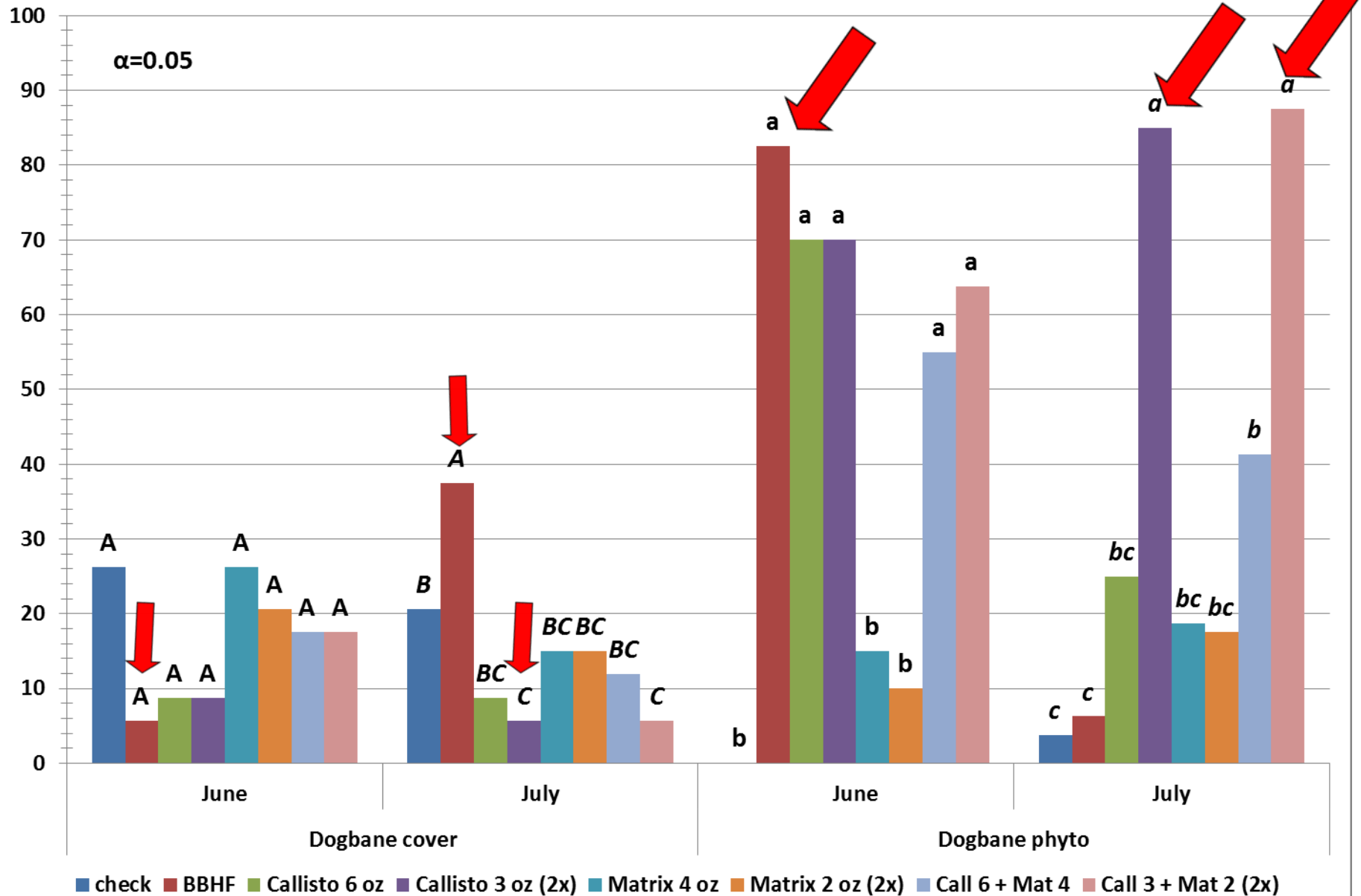


2015 Dogbane control trial - wild blueberry cover and phytotoxicity

$\alpha=0.05$



2015 Dogbane control trial - dogbane cover and phytotoxicity



Results - Dogbane

- **Wild blueberry cover** was initially reduced by in the Matrix 4 oz/a treatment
- In July, the split Callisto+Matrix treatment was lower compared to the untreated
- No differences in blueberry phyto in June; by July the split Matrix treatment split Callisto+Matrix had significantly more phyto
- **Dogbane** cover in June
 - In June, cover in BBHF's pre-emergence treatment was lower than all other treatments
 - In July, cover in BBHF's pre-emergence treatment was higher so dogbane recovered
- **In June Callisto pre and post treatment reduced dogbane but by July dogbane injury approached 90% and cover <10% in the Callisto split and Callisto+Matrix split treatment**
- Other weed cover was <12% overall with no significant differences at either evaluation

Conclusions

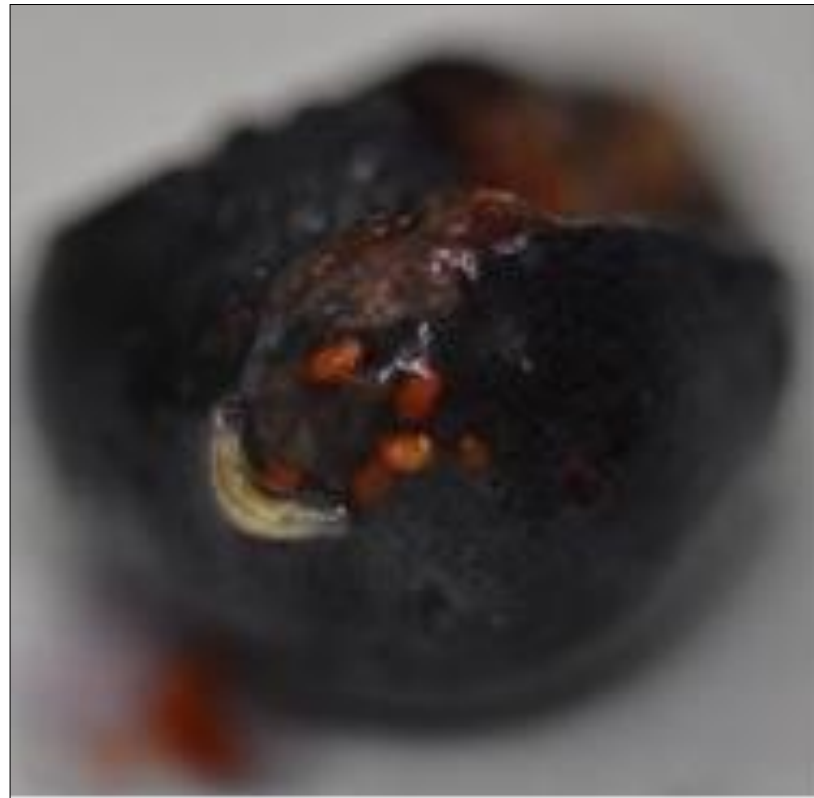
- Red sorrel trial
 - The addition of Alion and Chateau improved the effectiveness of control when combined with Velossa and should be evaluated further
 - Also fall timing applications of Alion and Chateau in prune year should be evaluated to prevent crop year growth
- Horseweed trial
 - Not resistant to mixture of labeled herbicides so best controlled with spring preemergence application
- Dogbane trial
 - The Callisto split treatment was most effective in controlling dogbane
 - Still had dogbane plants emerging after the second application so will request changes in the label to allow for additional applications

SWD update - 2015



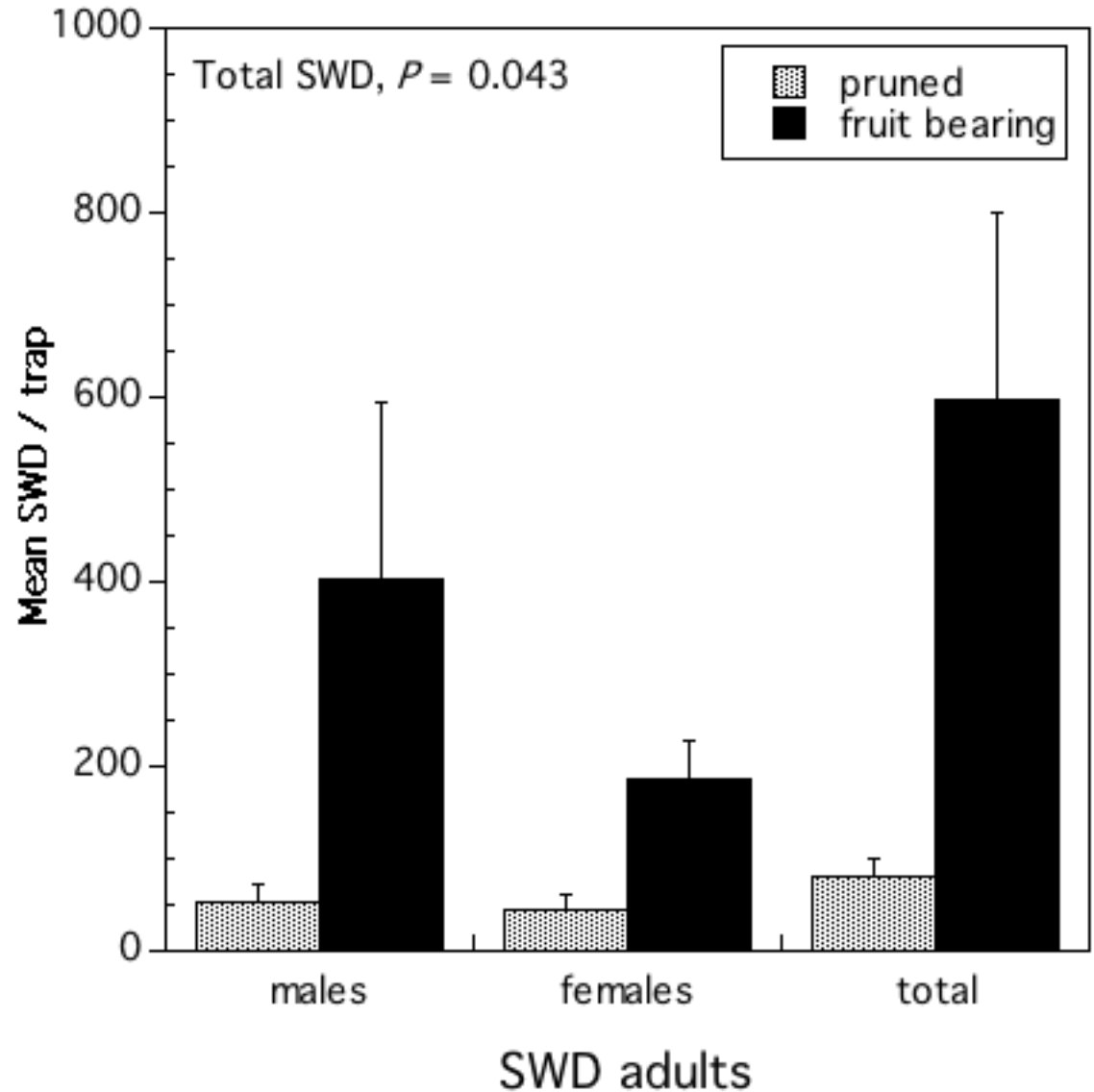
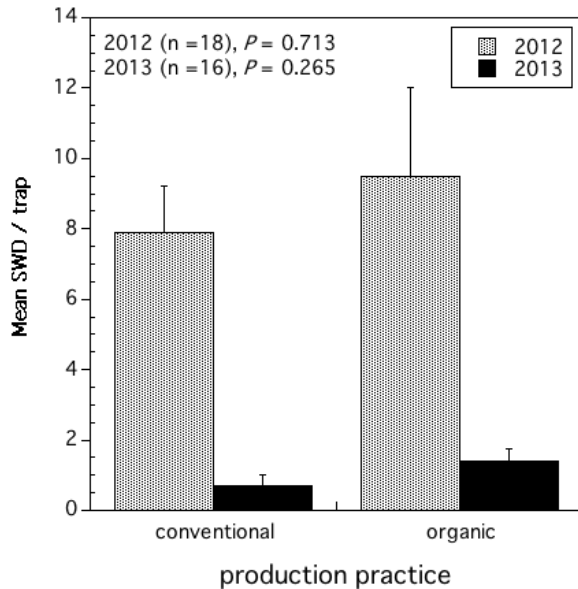
SWD detected in Maine - Nov 2011

- 2015 – fourth year: *what did we learn this year ?*



SWD infests all “representative” fields (2012)

1. All blueberry growing regions
2. Conventional and organic
3. Isolated and aggregated
4. Prune and crop



wild fruits on edge of blueberry fields (2015)

- sampled 16 wild blueberry fields in 4 counties
- identified wild fruit species along edges
- collected fruit (n=1,817)
- held fruit and incubated
- identified emerging insects

spotted wing drosophila

Crop Hosts:

Raspberries, blackberries



Strawberries



Blueberries

Cherries



Elderberries

Peaches, nectarines



Plums

Grapes

Tomatoes



Wild Hosts:

Chokecherry



Honeysuckle

Brambles



Buckthorn

Pokeweed

Dogwood

Autumn Olive



Japanese Yew



Rose hips

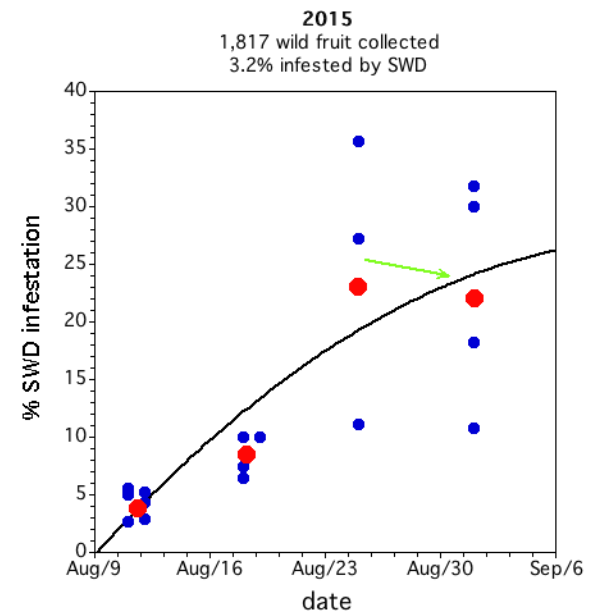
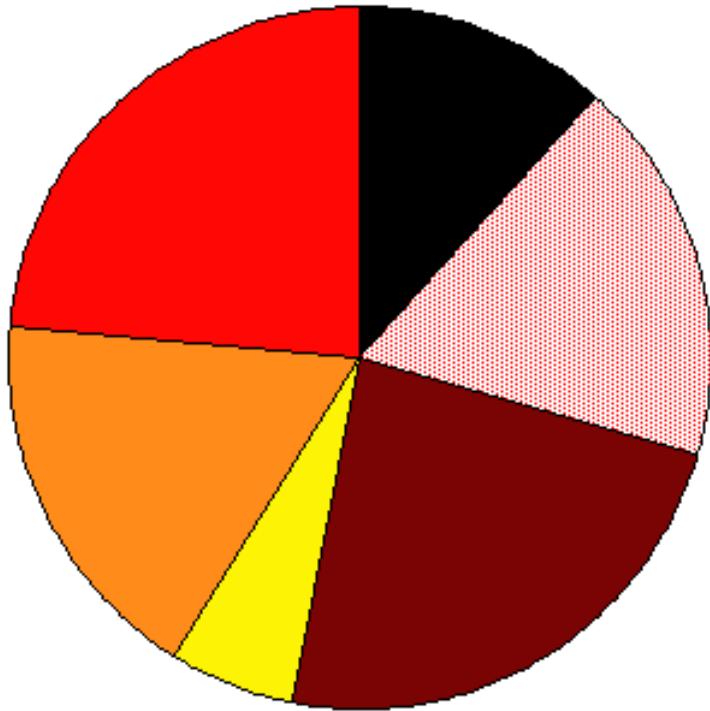


Nightshade

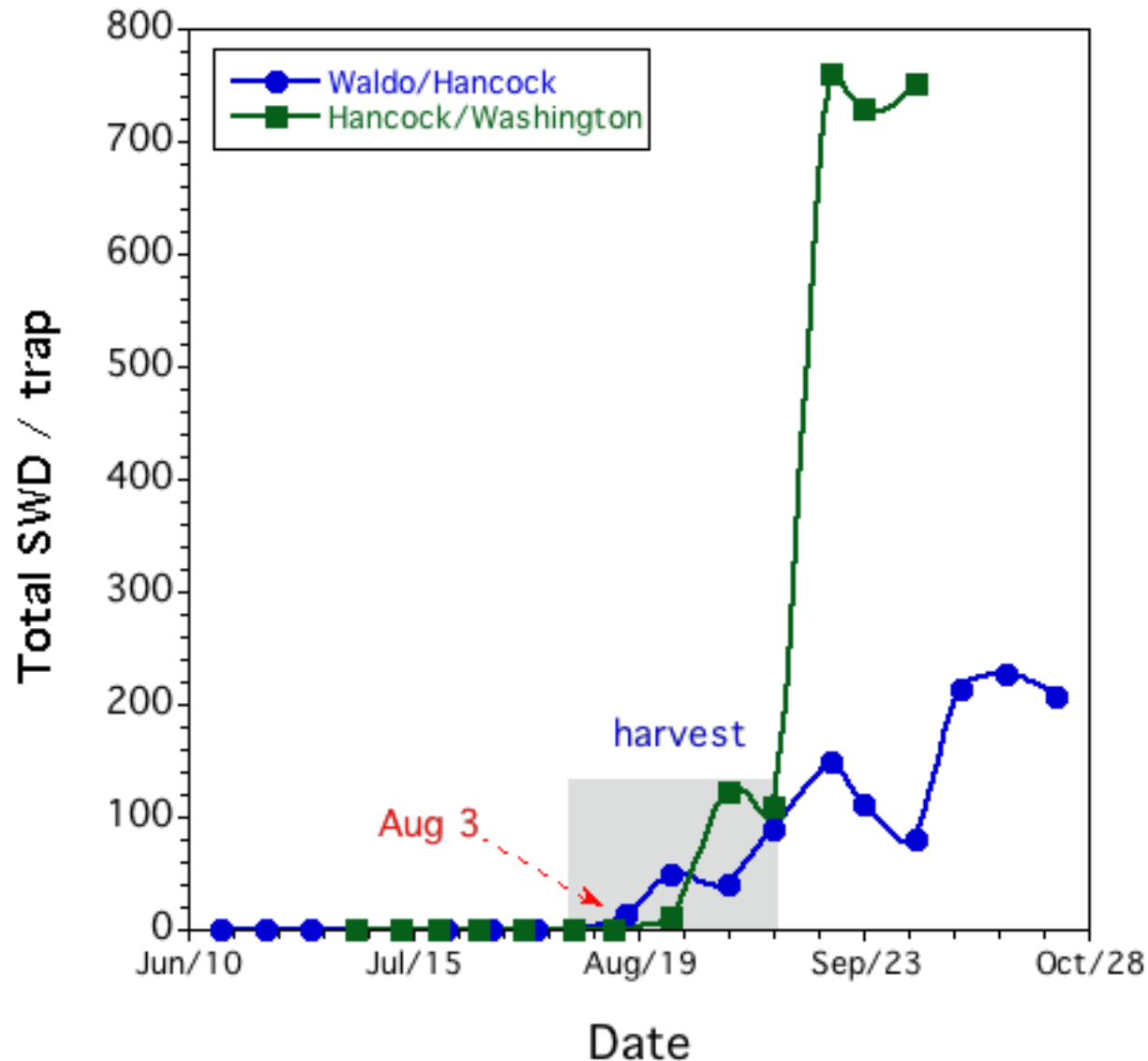
results

- fruit species = 11
- fruit species infested by SWD = 6

swd wild fruit survey

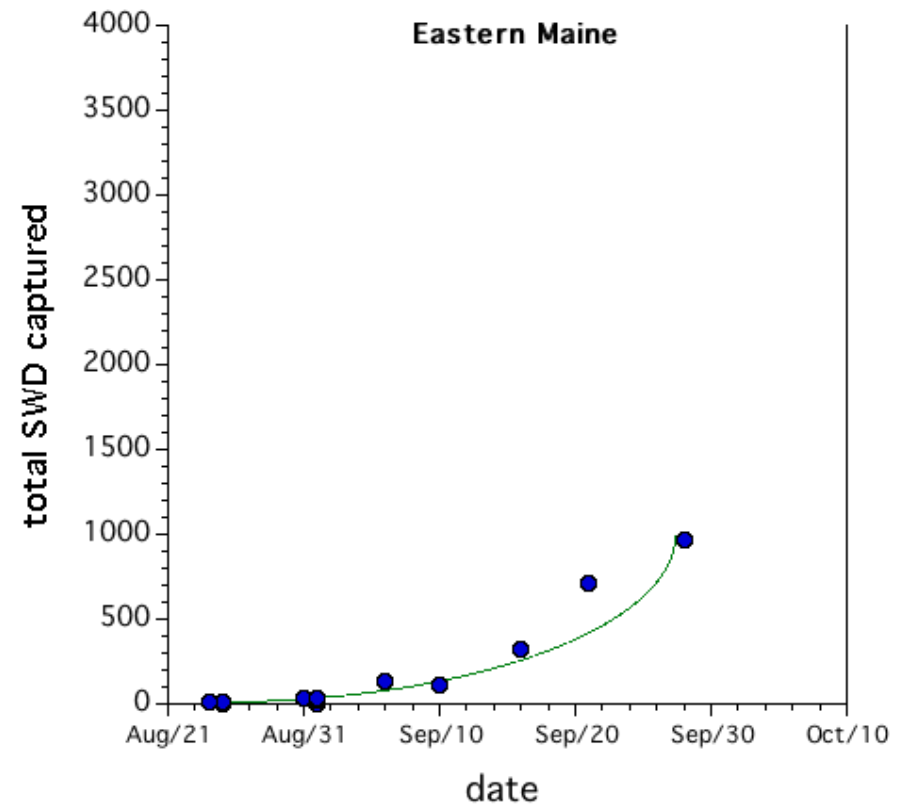
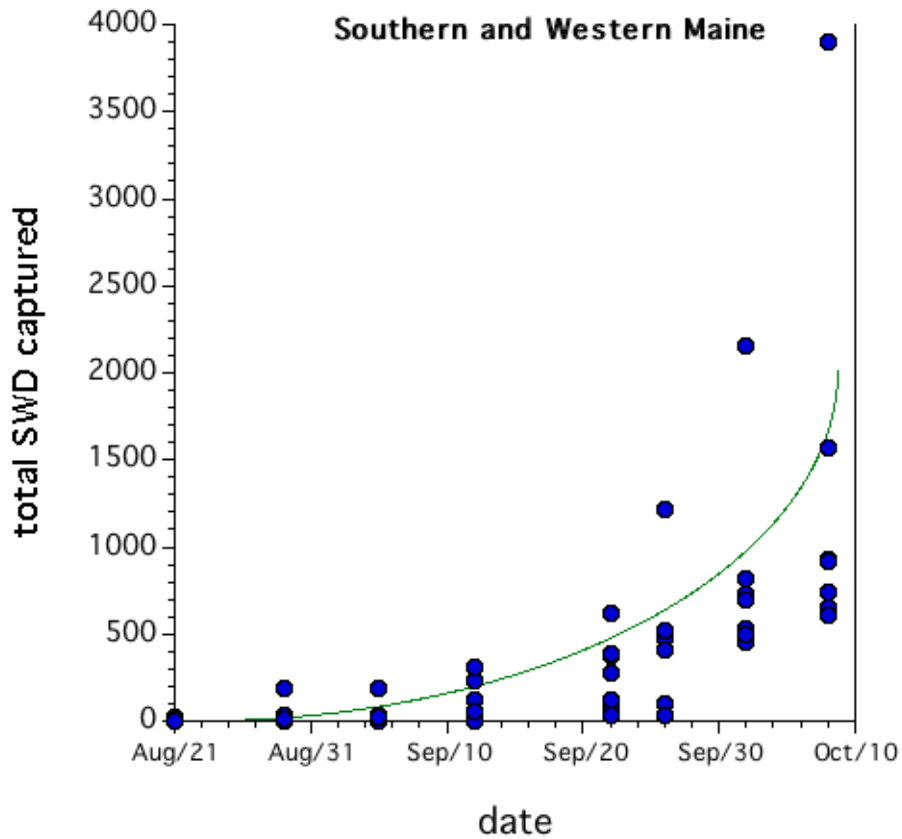


SWD population increase in 2012



SWD population increase in 2015

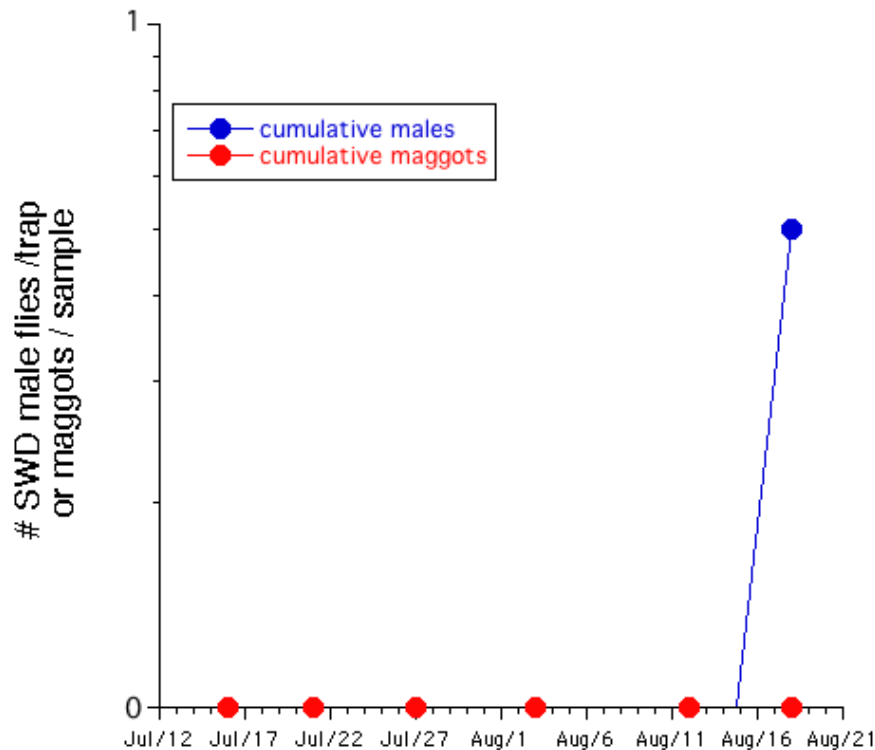
(n = 42 fields*)



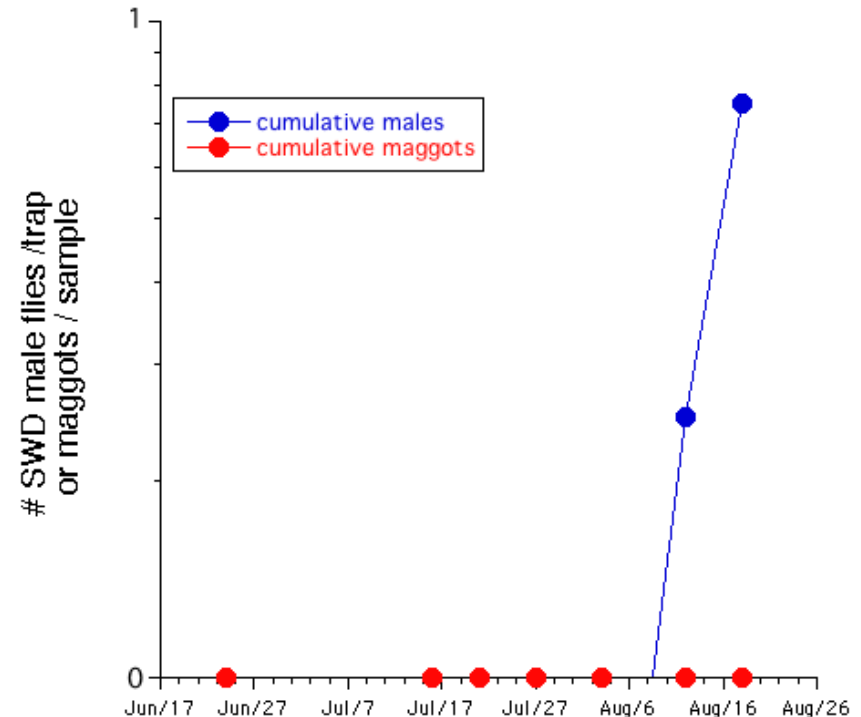
SWD occurrence relative to harvest

2015 Monitored 17 fields – all but TWO were harvested BEFORE damage detected

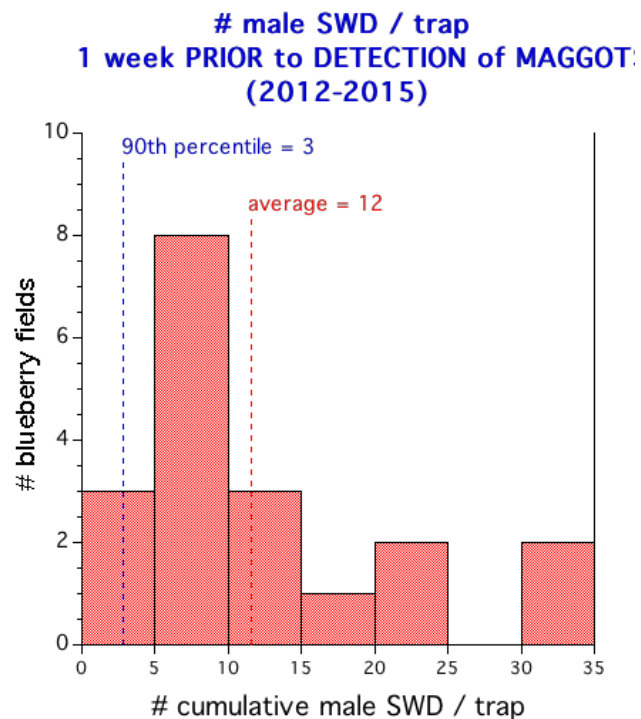
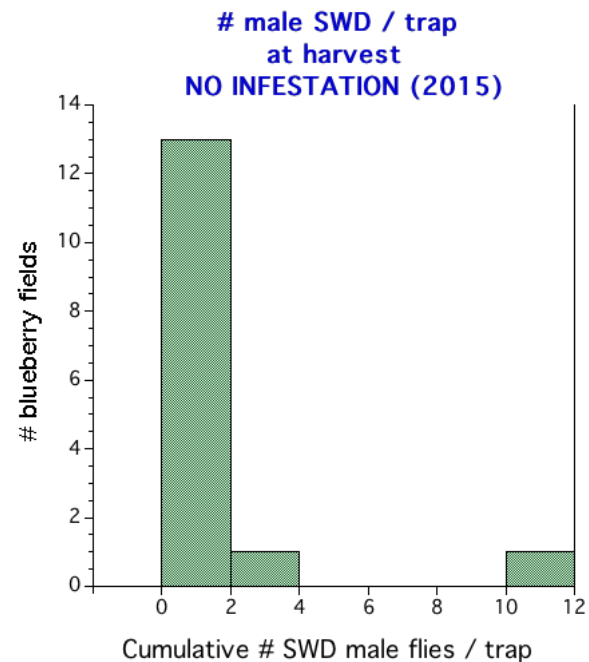
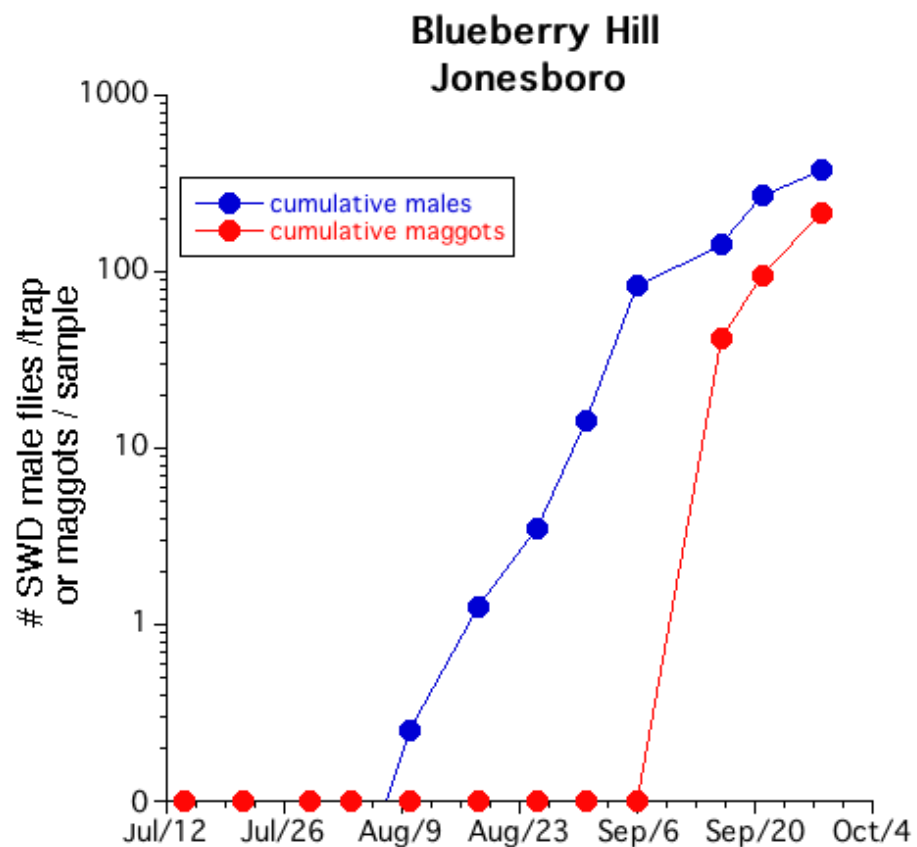
Washington Field



Orland Field



SWD thresholds?



SWD Captures Increase late in Season

Town	Spotted Wing Drosophila weekly trap catch 9/4/15
Limington	228
Limerick	23
Wells	35
Cape Elizabeth	399
Bowdoinham	90
Dresden	58
Nobleboro	111
Buxton	127
Livermore Falls	10
Mechanic Falls	11
Poland Spring	54
Monmouth	1200*
Wales	108
Springvale	372
Fayette	102

	Spotted wing drosophila weekly trap catch 10/9/15
Limington	202
Limerick	840
Wells	1392
Cape Elizabeth	233
Bowdoinham	78
Dresden*	1743
Freeport	28
Buxton	244
Livermore Falls	57
Mechanic Falls	122
Poland Spring	51
Monmouth*	99
Wales	17

