

BACKGROUND

- King Ferry Vineyards is a small scale commercial vineyard in Cayuga County, New York
- With a reputation for local, sustainable production, King Ferry Vineyards strives to incorporate environmentally-friendly management into its operations
- The vineyard uses no herbicides and practices alternative weed control measures.
- This study was conducted to investigate the potential of cover crops to act as weed suppressors



Typical Non-Cover Cropped Plot



Plot with Buckwheat Cover Crop

OBJECTIVES

- Identify weed species in the vineyard and estimate their relative abundance
- Determine the impact of cover crops on weed diversity
- Determine the impact of cover crops on weed abundance

MATERIALS & METHODS

- Sixty eight *Vitis vitifera* (grape) plots were included in this 2015 study, each approximately 3m in length and 0.6m wide.
- Plots received no herbicide application.
- Weed diversity and abundance under each of two cover crops, *Cichorium intybus* (chicory) and *Fagopyrum esculentum* (buckwheat), were compared to plots with no cover crop.
- Weeds were randomly surveyed and identified to the species level. Weed abundance was scored on a 0 to 4 scale where 0 corresponded to weed absence and 4 corresponded to high abundance.

RESULTS

- 38 weed species were identified in the study (Table 1)
- Only 4 of these weed species were found in cover cropped plots: dandelion (*Taraxacum officinale*), broadleaf plantain (*Plantago major* L.), milkweed (*Asclepias syriaca*), and leafy spurge (*Euphorbia escula*)
- The difference in weed diversity between the non-cover cropped plots and the cover cropped plots was significant ($p < 0.01$)
- The abundance of milkweed and leafy spurge was lower in the non-cover cropped plots than in the cover cropped plots (Figure 1)
- The abundance of broadleaf plantain and dandelion was higher in the non-cover cropped plots than in the cover cropped plants (Figure 1). In the case of dandelion this difference was significant ($p < 0.05$)

Table 1. Weed Diversity and Average Abundance throughout Vineyard (0 – 4 Scale)

Common Name	Scientific Name	Avg. Abundance (0 to 4)
Dandelion	<i>Taraxacum officinale</i>	3.25
Grasses	N/A	2.49
Vetch	<i>Vicia sativa</i> L., VISCA	1.57
Broadleaf Plantain	<i>Plantago major</i> L.	1.47
Red Clover	<i>Trifolium pratense</i>	1.31
Wild Carrot	<i>Daucus carota</i>	1.12
Narrow Plantain	<i>Plantago lanceolata</i>	0.79
Yellow Wood Sorrel	<i>Oxalis stricta</i> L.	0.71
White Heath Aster	<i>Aster pilosus</i> Willd.	0.63
Lambquarters	<i>Chenopodium album</i> L.	0.57
Sow Thistle	<i>Sanctus oleraceus</i> L.	0.51
Horsenettle	<i>Solanum carolinense</i> L.	0.46
Golden Rod	<i>Solidago canadensis</i> L.	0.44
Common Chickweed	<i>Stellaria media</i>	0.38
Bristlefoot Trefall	<i>Lotus corniculatus</i> L.	0.37
Milkwed	<i>Asclepias syriaca</i>	0.34
Pennsylvania Smartweed	<i>Polygonum pennsylvanicum</i> L.	0.25
Leafy Spurge	<i>Euphorbia escula</i>	0.21
Black Medic	<i>Medicago lupulina</i>	0.18
Chicory	<i>Cichorium intybus</i>	0.15
Field Bindweed	<i>Convolvulus sepium</i> L.	0.13
Red Pigweed	<i>Amaranthus retroflexus</i> L.	0.10
White Campion	<i>Silene alba</i> (Mill.) E.H.L. Krause	0.09
Common Choke Cherry	<i>Prunus virginiana</i> L., PRNVG	0.07
Black Swallow Wort	<i>Cynanchum nigricum</i> (L.) Pers.	0.07
Staghorn Sumac	<i>Rhus typhina</i> L.	0.06
Virginia Creeper	<i>Parthenocissus quinquefolia</i>	0.04
Curly Dock	<i>Rumex crispus</i>	0.03
Bittersweet Nightshade	<i>Solanum dulcamara</i>	0.03
Common Burdock	<i>Arctium minus</i> (Hill) Bern.	0.03
Burweed	<i>Ambrosia artemisiifolia</i> L.	0.03
Multiflora Rose	<i>Rosa multiflora</i> Thunb. ex Murr.	0.03
Velvetleaf	<i>Abutilon theophrasti</i> Medicus	0.01
Field Pennycress	<i>Thlaspi arvense</i> L.	0.01
Prostrate Knotweed	<i>Polygonum aviculare</i> L.	0.01
Poison Ivy	<i>Toxicodendron radicans</i>	0.01
New England Aster	<i>Aster novae-angliae</i> L., ASTNA	0.01
Wild Grape	<i>Vitis</i> spp.	0.01

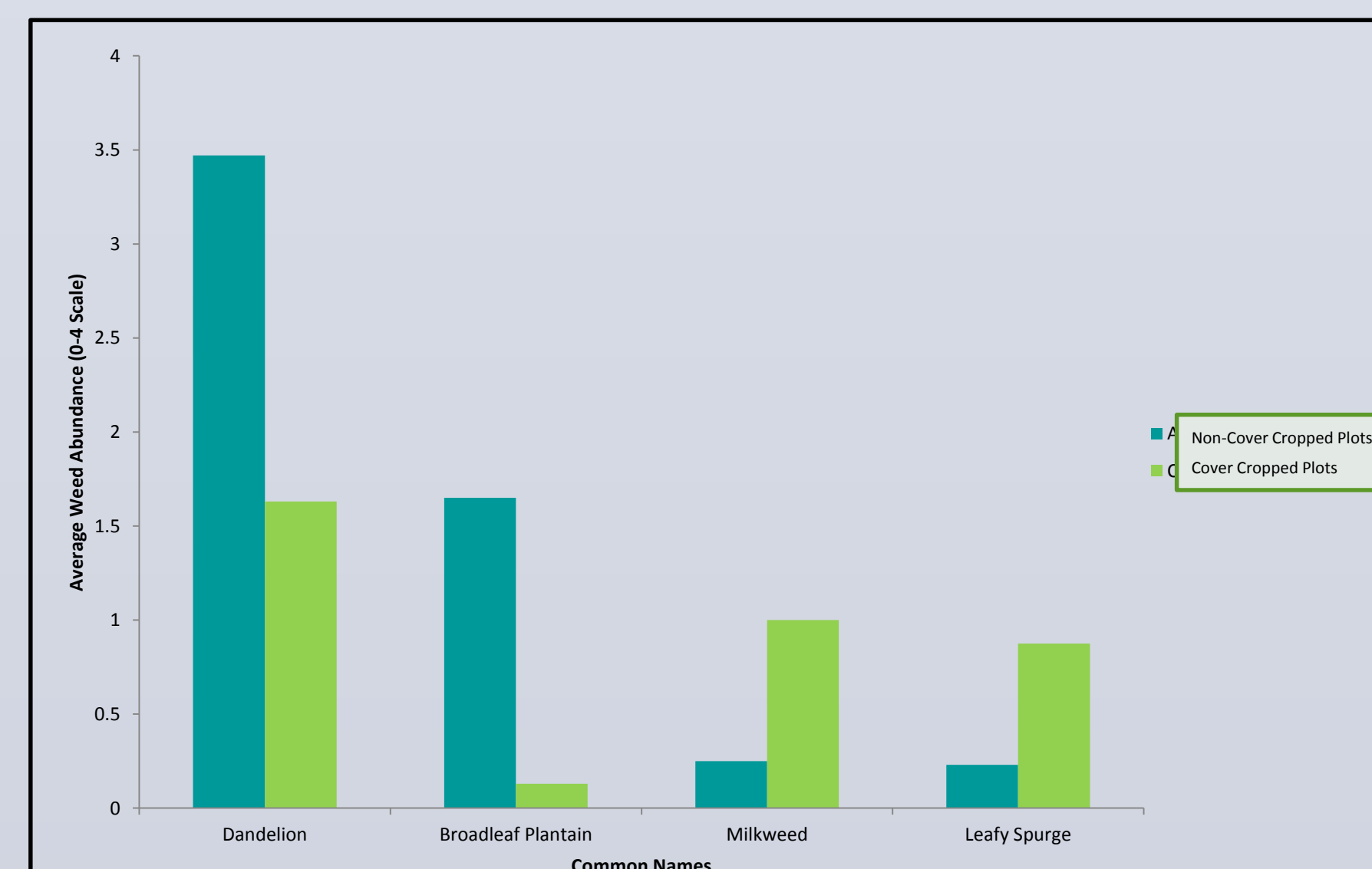
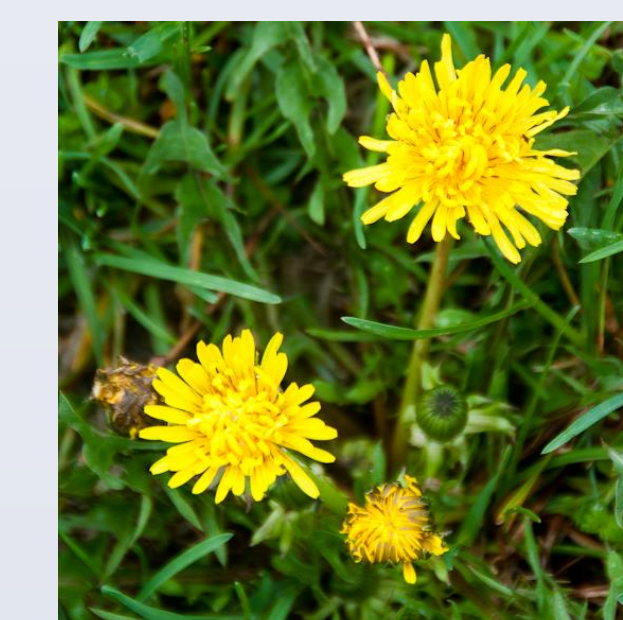


Figure 1. Weed Abundance in Non-Cover Cropped Plots (blue) versus Cover Cropped Plots (green)

CONCLUSIONS

- Cover crops significantly reduced weed diversity
- Cover crops significantly reduced dandelion abundance
- In combination with other weed control measures, cover crops can play a role in weed management in vineyards in the Northeast.



Dandelion



Broadleaf Plantain



Milkweed



Leafy Spurge

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