

Summary of the 2021 effort to monitor winged aphids in southern Idaho as a tool to minimize *Potato virus Y* in early generation seed potato lots

Overall, our goal is to provide information on aphid flights for seed potato growers who strive to manage incidence of *Potato virus Y* (PVY) in their early generation seed lots. Great economic loss (possibly 3- to 4-fold per cwt) can be realized by early generation seed potato growers if PVY incidence exceeds 1% in the daughter tubers, which renders the seed ineligible for re-certification (that is, the crop cannot be used to produce another generation of seed potatoes, though it can be sold as certified seed to produce a commercial crop). The loss for seed potato growers is strictly due to incidence of PVY exceeding 1% – a quality issue – and not to direct yield loss. Thus, any tool that can help keep PVY incidence low is essential for early generation seed potato growers. No management strategy by itself is a silver bullet for keeping PVY incidence low in early generation seed lots; however, understanding when aphid flights are occurring can help growers more strategically apply mineral oil regiments or to determine whether killing vines at an earlier date would be beneficial, to avoid late-season flights of aphids that might move PVY from infected to healthy plants and subsequently to the maturing daughter tubers.

In 2021, The University of Idaho, the Idaho Crop Improvement Association and other collaborators, in cooperation with growers and agronomists in the private sector, monitored 37 traps for number of winged aphids captured. Five traps were located in commercial growing areas, while all others were associated with fields being grown to seed potatoes. Of the 37 traps, 29 were yellow bucket traps (2-gallon size, with water as the capture medium), four were short/mobile suction traps (<2m in height) and four were tall/permanent suction traps (>6m in height). Suction traps used PEG as the capture medium, and each one was paired with a bucket trap to determine which trap more reliably captures winged aphids based on numbers and composition of species (or best identification). Periodically throughout the summer, reports summarizing our winged aphid counts were distributed via an email list targeting seed potato growers and other interested parties; reports were also posted on the ICIA website and the www.cropalerts.org website. The results of the 2021 monitoring efforts are summarized in the **Table** below.

Four short/mobile suction traps (<2 m tall; privately owned, operated and serviced) were included in the monitoring efforts and were located next to seed potato fields. Four of the suction traps are much taller (6-9 meters) and permanently placed, usually not very close to a potato field. In 2021, the locations for the tall/permanent suction traps were Aberdeen REC (newly restored), Tetonia REC, Grace, and Dietrich area. These were part of the previous 1985-2003 Idaho aphid monitoring program. This year, the Ashton suction trap was abandoned by the program, since has not reliably captured aphids for several years. We now have three years of data to help determine which trap type is optimal; however, **identification of aphid species (or related groups)** is necessary to determine if there are differences in species composition between trap types. Efforts to identify aphid species captured in 2021 are scheduled to occur over the winter.

In addition to the traps noted above, additional buckets dedicated for molecular analyses (aphids were not counted in these buckets) were paired with spore traps placed in commercial growing areas. Contents from these bucket traps were bulk tested for PVY and Lso (broadly, including non-potato strains of the pathogens). Successful detection of these insect-vectored organisms has been demonstrated and the technique was once again used successfully in 2021. Results for PVY and Lso were reported weekly with the University of Idaho Spore Trap Network, a monitoring program separate from this aphid project that focuses on windborne plant pathogens of potato, sugarbeet and other crops primarily in commercial areas.

Table. Numbers of winged aphids captured in yellow bucket water traps or suction traps from June 1 through September 6, 2021.

Location/Date	6/1-6/7	6/7-6/14	6/14-6/21	6/21-6/28	6/28-7/5	7/5-7/12	7/12-7/19	7/19-7/26	7/26-8/2	8/2-8/9	8/9-8/16	8/16-8/23	8/23-8/29	8/30-9/6
Aberdeen	1	0	2	8	10	23	24	111	94	380	167	11	29	27
Aberdeen*	6	7	8	5	--	--	--	--	2	171	--	28	0	0
American Falls	6	.**	2	7	7	36	224	390	11	--	8	18	3	15

Location/Date	6/1-6/7	6/7-6/14	6/14-6/21	6/21-6/28	6/28-7/5	7/5-7/12	7/12-7/19	7/19-7/26	7/26-8/2	8/2-8/9	8/9-8/16	8/16-8/23	8/23-8/29	8/30-9/6
Arco east	--	--	--	5	3	--	24	11	20	1	2	9	--	--
Arco south	--	--	--	2	2	12	29	27	48	6	0	1	--	--
Arco west	--	--	--	1	1	9	33	19	45	38	2	5	--	--
Ashton 1	--	2	0	0	4	1	5	16	18	14	3	2	0	0
Ashton 2	--	4	6	4	8	2	3	7	4	3	0	1	0	2
Ashton 3	--	0	0	5	16	6	4	3	17	13	2	0	0	3
Ashton 4	--	--	4	7	7	--	17	8	12	42	1	2	1	2
Blackfoot	9	2	3	3	10	7	15	100	78	587	62	57	1	26
Downey 1	--	--	0	1	7	7	8	--	--	--	--	--	--	--
Downey 2	--	.	4	11	6	5	3	--	--	--	--	--	--	--
Driggs 22	--	--	--	--	673	81	34	28	28	5	12	--	--	--
Driggs 58	--	--	--	--	--	8	36	67	331	37	3	--	--	--
Driggs 58*	--	--	--	--	938	68	45	--	18	40	224	--	--	--
Driggs D3	--	--	--	--	226	--	27	32	33	17	16	--	--	--
Driggs D3*	--	--	--	--	28	7	7	--	18	9	30	--	--	--
Driggs RB	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Driggs RR6	--	--	--	--	--	15	48	--	1	12	12	--	--	--
Grace 1	--	--	7	14	28	22	65	49	70	23	--	--	--	--
Grace 2	--	--	1	5	0	17	38	47	139	95	--	--	--	--
Grace 3	--	--	--	6	4	10	11	7	19	12	--	--	--	--
Grace 4*	--	--	--	--	3	4	6	9	6	0	--	--	--	--
Hidden Valley E	--	--	--	4	5	9	--	1	6	0	6	4	--	--
Hidden Valley S	--	--	--	4	10	--	7	2	1	0	0	1	--	--
Hidden Valley*	--	--	--	--	--	4	10	--	2	2	2	0	--	--
Holbrook 1*	--	--	1	3	7	4	26	37	9	9	3	--	--	--
Holbrook 1	--	--	.	--	9	6	132	22	2	0	1	--	--	--
Holbrook 2*	--	--	0	0	1	0	1	1	0	0	0	--	--	--
Holbrook 2	--	--	.	5	12		2	36	5	1	2	--	--	--
Holbrook 3	--	--	.	8	25	9	21	30	9	2	3	--	--	--
Rexburg	2	1	8	17	14	6	20	117	36	4	0	2	0	0
Soda Springs 1	--	14	--	--	2	8	41	15	.	68	230	20	28	14
Soda Springs 2	--	0	--	--	11	3	27	23	.	17	68	18	0	20
Tetonia REC	--**	4	3	5	18	3	184	--	27	150	22	13	4	--
Tetonia REC*	--	8	54	62	78	64	355	--		87	72	34	96	153

* Insect Suction trap (green: <2 m; blue: 6-9 m tall); all others are 2-gallon yellow bucket traps

** A double hyphen (--) means a sample was not received. A period (.) indicates that a sample was received but it was too deteriorated to evaluate.

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