



BADGER MEMO

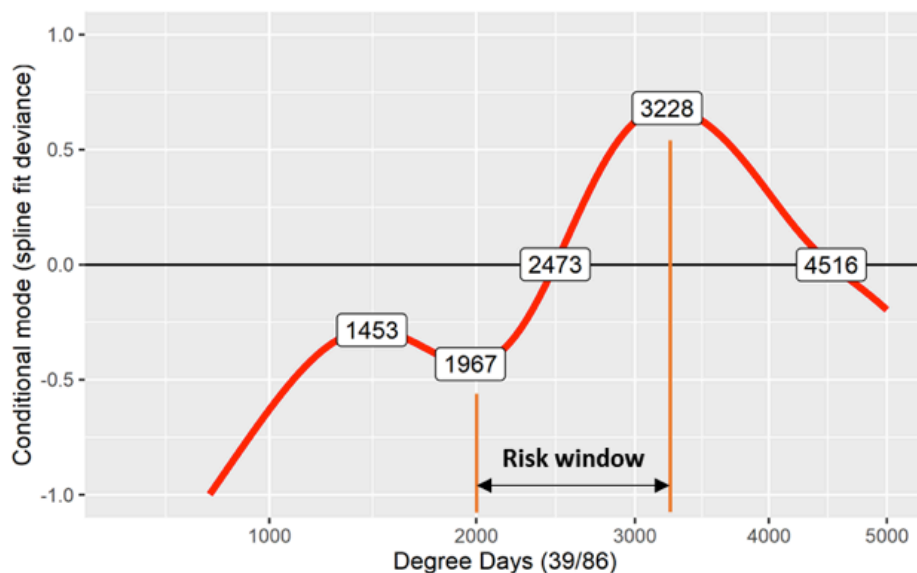
March 2020

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Aphid PVY Transmission Risk Window

A presentation given at the WSPIA Annual Meeting by Dr. Russ Groves described a model depicting aphid flights for species likely to spread PVY in Wisconsin potatoes. The PVY risk index is a model built from suction trap data that highlights a time frame (Risk Window) during the growing season where aphid pressure is highest. Based on many years (2005-2018) the model fit of risk is based on degree days. Cole Lubinski plugged the growing degree criteria into a Wisconsin climatic website to show the risk windows over the last three years based on the closest weather stations. This risk window starts at 1967 GDUs and goes until 3228 GDUs. If you remember 2018 was a warmer than average spring and summer with an above average degree day accumulation.



Twice weekly oil sprays and potentially using feed blockers or aphicides should be targeted within this window. Notice the risk for most locations extends well into September.

	Antigo	Eagle River	Post Lake	Mountain	Rhineland
2017	7/27-9/23	8/1-10/4	7/25-9/22	7/23-9/17	7/22-9/17
2018	7/19-9/4	7/21-9/11	7/12-8/26	7/16-8/28	7/14-8/26
2019	7/29-9/24	8/3-10/7	7/29-9/25	7/26-9/17	7/22-9/16

Red Potato Skin Color Response to 2,4-D Application Timing in Potato

Sub-lethal rates of auxin type herbicides have been used for decades to enhance the skin color in red potato varieties. Although extensively used, growers often report highly variable skin color response with some applications resulting in little to no improvement in skin color. Was the lack of response due to Environment? Application timing? Varietal? Unfortunately, little is understood about the pathways involved in this color response making it even more difficult to pinpoint the cause. This study evaluated the effect of application timing on skin color of Red Norland potato.

Materials and Methods

Red norland B-sized seed was planted at the Horticulture Farm of the Arlington Ag Research Station on 5/16/2018 and 5/14/2019. Plots were 2-row spaced 36" apart by 20' in length and consisted of four replications. Plots were spaced 12' apart to prevent drift between the plots during 2,4-D application. Standard pest management practices were used in producing the crop. 2,4-D was applied foliar to the crop in either a single or double application at specific stages of growth.

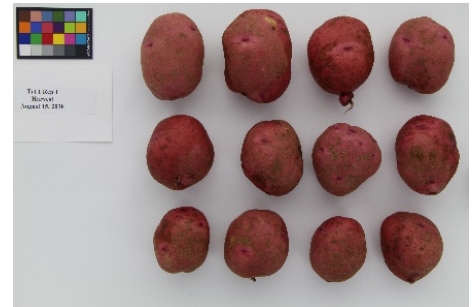
All applications were made using the Weedone LV4 product at a rate of 2.33 oz/A applied through Teejet XR8003 flat fan nozzles in 20 GPA of water. Bud stage was defined by plants having at least one tightly closed flower bud. Tuber initiation was defined by digging stolons and visually identifying approximately 0.25" diameter tubers.

Vine desiccant was applied in a single application 7-10 days prior to harvest. Tubers were harvested on 8/14/2018 and 8/16/2019. For all plots, tubers were yielded, and two subsamples of 20 tubers were collected. One subsample was washed and photographed in a light box to quantify color immediately after harvest while the other sample was stored for approximately 4 months, then washed and evaluated for color. Color quantification is presented using the HSV (hue, saturation, value) color scale.

Results and Discussion

Foliar injury caused by the 2,4-D application was similar across years, with the degree of injury decreasing when applications were made to larger plants. Although yield differed greatly between years, there was no significant differences between treatments within a given year.

Color quantification results for each year are found in tables 1 and 2. Numerous significant differences at the alpha = .05 level (as noted by means followed by a different letter) were observed between treatments. A number of these differences however would not be appreciable to the human eye. For hue, a difference of 4 degrees over the range of values observed would indicate a noticeable difference in tuber skin color. Hue values closest to zero would indicate a progression towards true red. Using this minimum of 4-degree criteria, in 2018 the treatments containing applications at bud or tuber initiation (in a single application or followed with a second application 7 days later) produced noticeably more red skin color at harvest.



Harvest rep 1, trt 1 – Plot 101 = untreated check at harvest in 2018



Harvest rep 1, trt 5 – Plot 105 = Single application at tuber initiation in 2018, picture at harvest



Stored RN Rep 1 TRT 5 = Single application at tuber initiation in 2018, picture after storage

2,4-D on Reds continued...

Out of storage, the same effect (although less pronounced) can be seen with hue values increasing (away from true red) for all treatments. In 2019 the same treatments resulted in the greatest color improvement at harvest with the addition of the double applied 7-10" & 7-10"+7d treatment. In 2019, the tubers out of storage maintained almost identical hue values to their counterparts at harvest.

Higher saturation values indicate a movement away from gray and towards a more true color. Saturation differences were noted between many of the treatments. However, similar to hue, saturation differences needed to be at least 4 units to produce a noticeable visible difference in color. Trends towards this 4-unit separation were observed in the 2018 harvest values, but were not noted in 2019 and saturation differences appear to even out completely after 4 months in storage.

Increasing value units indicates a move towards a more bright and vibrant color. Few significant differences are noted in value. Holding everything else constant, it takes about a 2-unit change in value for it to be noticeable to the human eye. No consistent trends were observed between treatments.



Foliar effects of 2,4-D treatment 10 days after application of plants at 4-6" plant height. The auxin herbicide damage makes it difficult even impossible to do an inspection for mosaic.

Table 1. 2018 HSV color scale quantification AOV means table for fresh and stored red norland tubers.

2018	Harvest						Storage					
Appl. Timing	H	S	V	H	S	V	H	S	V	H	S	V
Untreated Check	8.1	abc	62.2	a	52.3	ab	16.5	a	61.0	b	51.2	a
4-6"	9.4	a	61.3	ab	52.9	a	16.1	ab	62.2	ab	51.3	a
7-10"	8.6	ab	60.2	bcd	52.7	ab	13.6	a-d	61.5	ab	50.1	abc
Bud	3.5	f	59.6	cde	51.4	ab	13.0	bcd	62.6	ab	50.5	abc
Tuber Init	4.2	ef	57.9	f	52.4	ab	12.1	d	61.5	ab	50.4	abc
Tuber Init+7d	7.0	bcd	60.6	bc	51.8	ab	13.2	bcd	62.8	a	49.3	bc
4-6"	6.0	de	59.7	cde	52.6	ab	14.3	a-d	61.1	b	49.1	c
4-6"+7d												
7-10"	4.7	ef	59.5	cde	52.8	a	15.2	abc	61.5	ab	50.9	a
7-10"+7d												
Bud	3.5	f	58.8	def	51.1	b	13.1	bcd	61.4	ab	49.0	c
Bud+7d												
Tuber Init	2.8	f	58.4	ef	51.1	b	12.7	cd	62.8	a	50.0	abc
Tuber Init+7d												
Tuber Init+7d	6.2	cde	60.4	bc	51.8	ab	15.0	a-d	62.5	ab	50.6	ab
Tuber Init+14d												

Table 2. 2019 HSV color scale quantification for fresh and stored red norland tubers.

2019	Harvest						Storage					
Appl. Timing	H	S	V	H	S	V	H	S	V	H	S	V
Untreated Check	8.0	abc	59.1	abc	51.2	ab	6.9	bc	58.3	bc	51.3	a
4-6"	10.6	a	60.3	a	49.9	bc	11.2	a	60.9	a	49.0	b
7-10"	6.9	bcd	59.3	ab	50.3	abc	7.5	bc	59.4	ab	49.6	ab
Bud	4.1	ef	59.0	abc	49.5	bc	4.1	de	59.0	abc	49.5	ab
Tuber Init	4.2	def	58.5	abc	50.5	abc	4.0	de	58.1	bc	50.0	ab
Tuber Init+7d	8.6	ab	59.7	ab	51.9	a	8.6	ab	59.6	ab	51.6	a
4-6"	5.5	cde	57.8	bc	50.1	abc	5.5	cd	57.8	bc	50.1	ab
4-6"+7d												
7-10"	0.0	g	59.2	abc	48.9	c	0.4	f	59.2	abc	48.3	b
7-10"+7d												
Bud	1.8	fg	57.0	c	49.6	bc	1.8	ef	57.0	c	49.6	ab
Bud+7d												
Tuber Init	5.5	cde	59.5	ab	49.7	bc	5.9	bcd	59.9	ab	49.6	ab
Tuber Init+7d												
Tuber Init+7d	8.3	ab	59.1	abc	50.2	abc	8.3	bc	59.1	abc	50.2	ab
Tuber Init+14d												

The best application time for 2,4-D color enhancement in these trials for color was bud to tuber initiation

Requesting a Variance

Under ATCP 156 a grower may request a variance to replant seed for given.

1. Special conditions justify the certification
2. The lot will probably meet certification in the following season, which does not exceed 1% summer readings, and 5% post-harvest mosaic tests
3. Freedom from Bacterial Ring Rot
4. Causes no harm to seed quality, does not pose risk to potato industry and customers

Special conditions that justify variance for recertification are:

- This is the only source of this variety
- No other source exist (wide spread problems with a variety)
- Virus readings are very close to tolerances <0.75%

The likelihood that a lot will meet certification status the following year is variety dependent, is related to the field condition, and cultural practices used (rogue, tuber unit, crop protection). In general, for problem varieties (Silverton, Norkotah) lots with up to and including 0.75% will be eligible for recertification. For other lots, up to 1% mosaic is possible under special conditions listed above. All variances require a letter from the grower addressing the four conditions above. A sample format can be provided upon request.

Shipping to Colorado? Late Blight

A requirement for all seed sent to Colorado (San Luis Valley) is a Late Blight Incubation Test. This has been a requirement for years now, and without a test, their department of agriculture inspectors will not allow the seed truck or totes to be offloaded. We run this test within the department and may take up to 30 days to complete. The basic process is a 21-day incubation at temperatures conducive to late blight development.

Contact the office for details. This test is a part of Colorado's broader Quarantine rule for Late Blight. For more information:

<https://www.sos.state.co.us/CCR/GenerateRulePdf.do?ruleVersionId=8029>

Side note: Any lot entering Colorado with greater than 1% PVY virus also require a PVY test for the N strain of virus.

Antigo Research Station Help

The Langlade county research station will be in need of an individual to assist in field operations throughout the planting, growing, and harvest seasons. To get further information about this position please contact Cole Lubinski (715)350-1691.

Upcoming Events

Please plan ahead for certified seed tag printing!

March 10-12 Potatoes USA Annual Meeting, Denver, CO

March 31-Apr 2 WPS Farm Show, EAA Grounds, Oshkosh, WI

March 2020

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

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State Farm Greenhouse

By Joshua Kunzman

Despite snowy conditions outside January and February mark the start of planting at Lelah Starks Seed Potato Farm. Thousands of clean tissue culture plantlets make their way from Madison to be transplanted into the NFT Hydroponic systems to start the 2021 (FY1) field crop at the farm. Plants were planted with help from the Certification office: Diana and our New staff Cole and Matt so they could learn the process. (Thanks all for the help!)

Pickers will start working with the plants to harvest mini-tubers after about 6-7 weeks of growth. The pickers will go through the plants 2 times a week for the next several months, carefully picking tubers out between the roots, cleaning the dead leaves and monitoring plant health. We store the tubers on shelves to dry and cure in labeled clear clam shell containers before going into the cooler for storage until next spring. Some tubers will remain in the cooler for almost 13 months before being warmed to be planted in the field here.

Planning and plants are underway for the following months to plant in a 3rd greenhouse using NFT and then the Perlite potted stock in the last greenhouse. From this humble beginning of our FY1 seed, much of this seed will remain on the farm for our FY2 (2022) before going onto our Growers.



Open Seed Potatoes at the State Farm

The following seed is in excess from harvest or is available from a down adjustment in seed request.

Manistee	140 cwt	Megachip	320+ cwt
Oneida Gold	40 cwt	White Pearl	30 cwt

Please contact Alex for further information and pricing. abcrockford@wisc.edu or 715-610-4668. If there is no interest, seed will be made publically available in February.

Pre-approval of Seed Lots

ATCP 156 requires the pre-approval of all seed lots entering our certification program. Please get your North American Seed Potato Health Certificates or Nuclear Material Affidavits to us as soon as possible. Thank you. Foundation seed potatoes certified by another state, under standards equivalent to those in this chapter, and pre-approved by the college.

Licensed Varieties

Many new varieties developed by public breeding programs have new requirements for licensing and production. We request that you provide a license or communication with the licensor prior to requesting a variety for field production in our program. The crop directory has every variety requiring a license labeled as such.

We also will be requiring a license or material transfer agreement (MTA) be held by your farm prior to receiving the seed from our foundation seed program. Many of the new varieties being released from US and foreign programs require variety tracking. We appreciate your cooperation! This license requirement is always listed on the program's seed request form.

Caribou russet is amongst the new varieties required to have a license to obtain seed. No new licenses are being granted at this time.