

WSDA – WSU Leaf Index Management Tool



Washington State Department of Agriculture
Leaf Indexing Report Form



Completed forms should be mailed to:
WSDA Pesticide Management Division
21 N. 1st Ave., Suite #236
Yakima, WA 98902

Phone: 509-225-2647 Fax: 509-575-2210

Name / Contact: CHARLES CARLY
Phone #: 509-225-2647
Vineyard Name: DOWN TOWNE VINEYARDS
Location: ROAD 2004 - WAWA
County: YAKIMA
Section: 24 Township: 13N Range: 18E

Varieties Affected

Variety	Bud Break	Bloom	Set	Pea Size
MERLOT	MAY 6-2004	JUNE 7-2004	JUNE 15-2004	JUNE 28-2004

Location (Block, Row): MERLOT BLOCK 3 NW ROW 10

Make observations at least once a week/ One variety per sheet

Emerged Leaf Position	Observation Date	Any Phenoxy Symptoms Observed Yes or No	If Yes		Did it Rain Yes or No	Date	Amount	Duration	Wind Dir.
			Severity rating Scale 0-5						
1 Basal	MAY 10	Y	2		N				
2	17	Y	2		N				
3 4	24	Y	2 3		N				
5 6 7	31	Y	2 4 5		N				
8 9 10	JUNE 7	Y	4 4 3		N				
11 12 13	14	Y	5 5 4		Y	JUNE 1	.3"	6AM-3PM 9HRS	SW
14 15	21	Y	2 1		Y	JUNE 9	.2"	8:10AM 3-7PM 6HRS	SW
16 17	28	N	1 0		N				
18 19 20	JUL 5	N	0 0 0		N				
21 22	12	N	0 0		N				
23 24	19	N	0 0		N				
25 PSA 2018	26	N	0 0		N				1
NO NEW LEAVES	AUGUST 2				N				

<http://feql.wsu.edu>

WSDA – WSU Leaf Index Management Tool

A woman wearing a white cap and sunglasses is shown in profile, measuring a grapevine leaf with a ruler. She is in a vineyard with rows of grapevines stretching into the distance under a clear sky.

- ✓ Introduction
- ✓ Leaf Indexing as a Management Tool
- ✓ Recording Observations
- ✓ Site Selection
- ✓ How to Get Started
- ✓ How to End

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		25 26	26	N	0 0	N				
		No New Leaves	AUGUST 2			N				



0
No visible symptoms of phenoxy-like herbicide contact. Margins and lobes are well defined.



1
Possible rugose (bumpy) features on leaf surface. Possible shortening of lobes and sinus.



2
Will have rugose features as well as marginal disfiguration. The leaf is not able to fully open.



3
Diminished or possible lack of sinus. Leaf will be significantly smaller than those with a lesser rating.

Economic Loss



4
Definite deformation of leaf margins and sinuses. Venation will appear almost parallel.

Economic Loss



5
Grossly deformed leaf. Venation will be parallel.⁵ The leaf will be severely dwarfed.

Leaf Indexing as a Management Tool

- Weekly producer observations can be critical for assessing timing-severity of herbicide exposure
- These observations must be conducted uniformly by someone on site **full time**
- After training, observers can be easily trained

Objective

- Record bud break
- Record the date leaves unfurl
- Numerically record the node/leaf position
- The number must correlate to a date
- Weekly readings returning to the same grape shoot to establish a historical record

The Observation Process

Same day of the week

- Record the date of Bud Break or Bud Burst
- Next week record the unfurling of any leaf
Example: Two leaves unfurled since last week, the basal leaf is number 1, the next leaf is number two, RECORD THE DATE NEXT TO #1 and #2
- There is a lag time between the herbicide exposure and the expression of herbicide symptoms

The Observation Process, continued

- Next week look for and record any symptoms on #1 and #2 (the leaves that unfurled last week)
- Recording the date on the new leaf positions.
- A pattern develops, recording the date of new leaves and observing the development of the preceding leaves for symptoms.
- Always looking back for symptoms

Recording Date/Observations

- Observations for herbicide symptoms will be recorded on next visit to site, April 11

Emerged Leaf Position	Observation Date	Any Symptoms Observed Yes or No	Severity rating	Did it Rain Yes or No
1 Basal	April 4			



Look back to record symptoms because of lag time between exposure and visual symptoms

Record Observations Weekly

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 Section: 24 Township: 13N Range: 18E

Varieties Affected

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Location (Block, Row): MERLOT BLOCK 3 NW ROW 10

Make observations at least once a week/ One variety per sheet

Variety: <u>MERLOT</u>	Year: <u>2004</u>	If Yes			If Yes			
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No NEW LEAVES	AUGUST 2			N				

Why Weekly Readings?

- Weekly readings place somebody in the vineyard specifically to make observations for herbicide symptoms
- Timely decisions need to be made to grow the plants through the herbicide exposure using irrigation and a complete nutritional program as nitrogen alone is not enough

Recording Severity of Injury

Name / Contact: CHARLES CARLY
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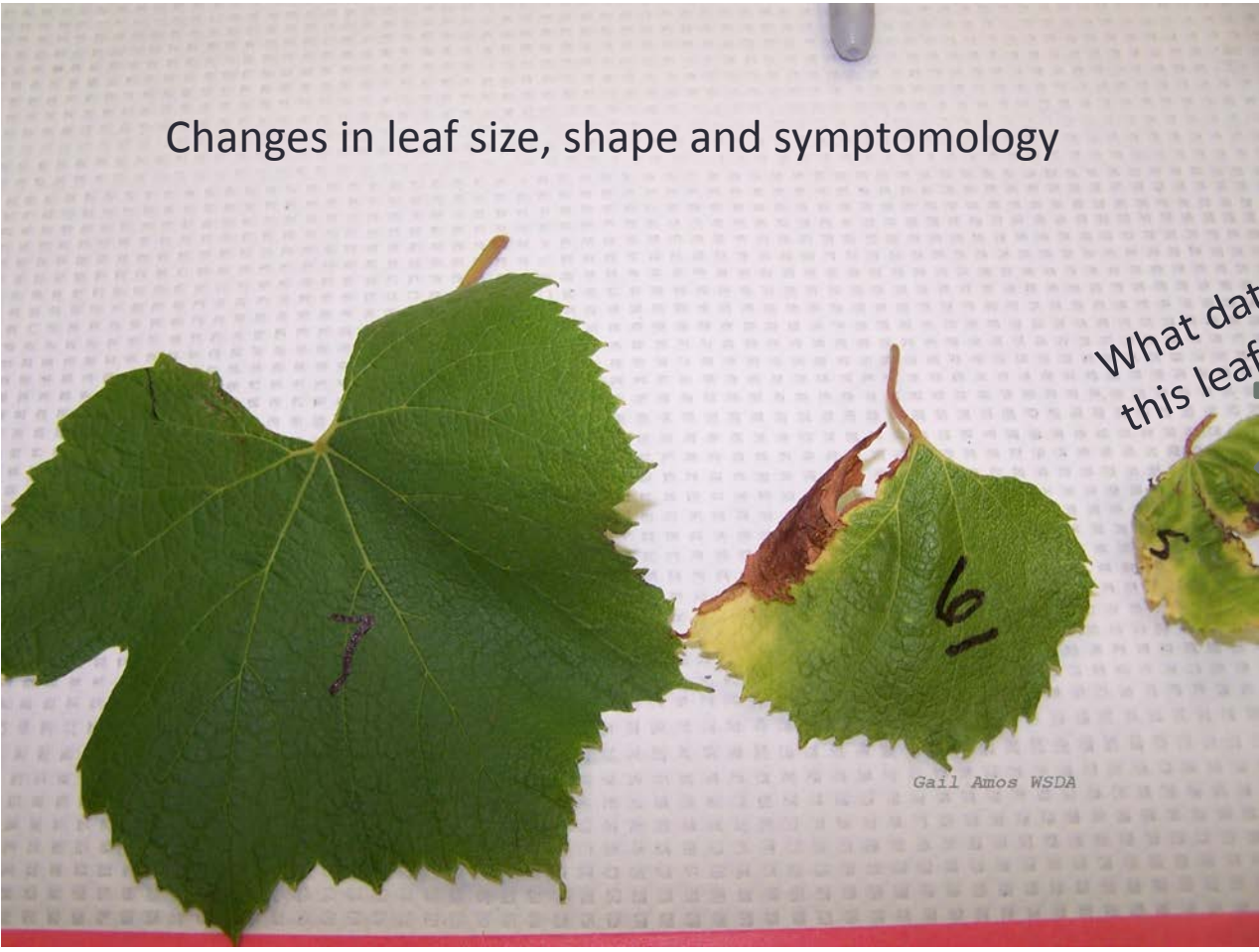


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What is Important



What is Important – Node Spacing



Caution

- New shoots are tender and easily broken if handled. Observe and take notes in a pocket notebook.
- Once the shoot and leaves become more mature numbers can be written on the leaves and shoot.



Recording Rain Events

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Record Rain Events

Rainwater can transport certain herbicides



Leaf without cutin adsorbs rain



Leaf with cutin repels rain

Rain is a source of herbicide transport. Water beads are formed on leaves with the waxy cutin layer formed. Water soaks into the leaves on the shoot tip (center), and is a path for an herbicide to enter the grape plant. This vineyard suffered \$290,000 in damages from a single rain event, WSDA case XXXX.

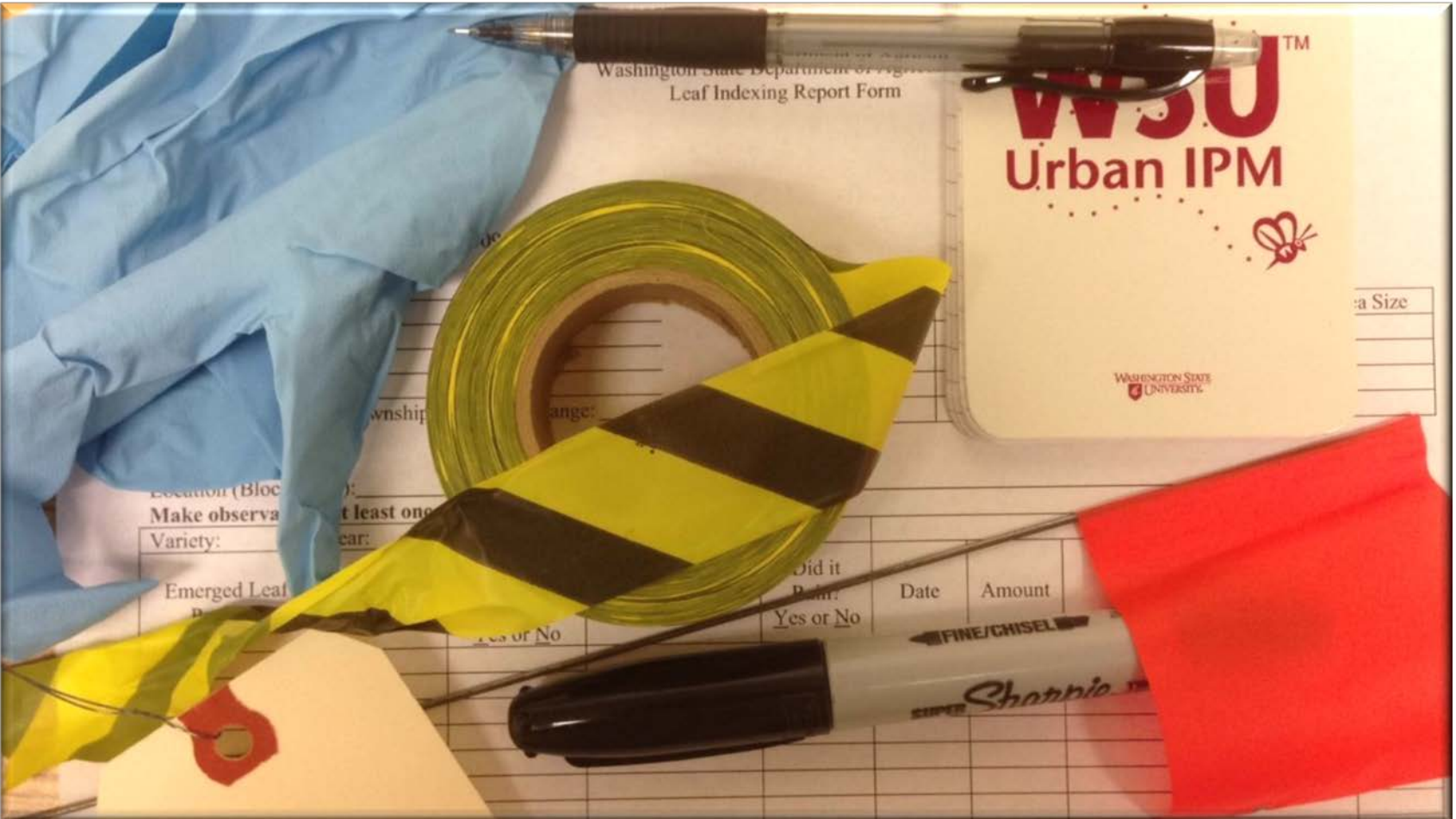


How Many Locations Should be Checked and Which Variety ?

- The number of shoots selected will depend on your time and ability to observe the shoots on a weekly basis throughout the growing season; a minimum of three is recommended
- The variety selected for observation will not be as important as selecting a set of varietal shoots that you will be able to observe weekly
- Generally white varieties exhibit more symptoms than red varieties.

How to Get Started

Tools



Where Do I Start In This Vast Vineyard?



Select a Location to Monitor

Landmark near a driveway. Make it easy!



Row Location Marker



Row Location Marker

Use a marker/color not common in the vineyard



Mark the shoot

Flagging tape works well to mark the shoot. Tie to the vine/wire near the base of the shoot . **ANYTHING TIED TO THE NEW SHOOT WILL CREATE WIND RESISTANCE AND IS EASILY BROKEN**



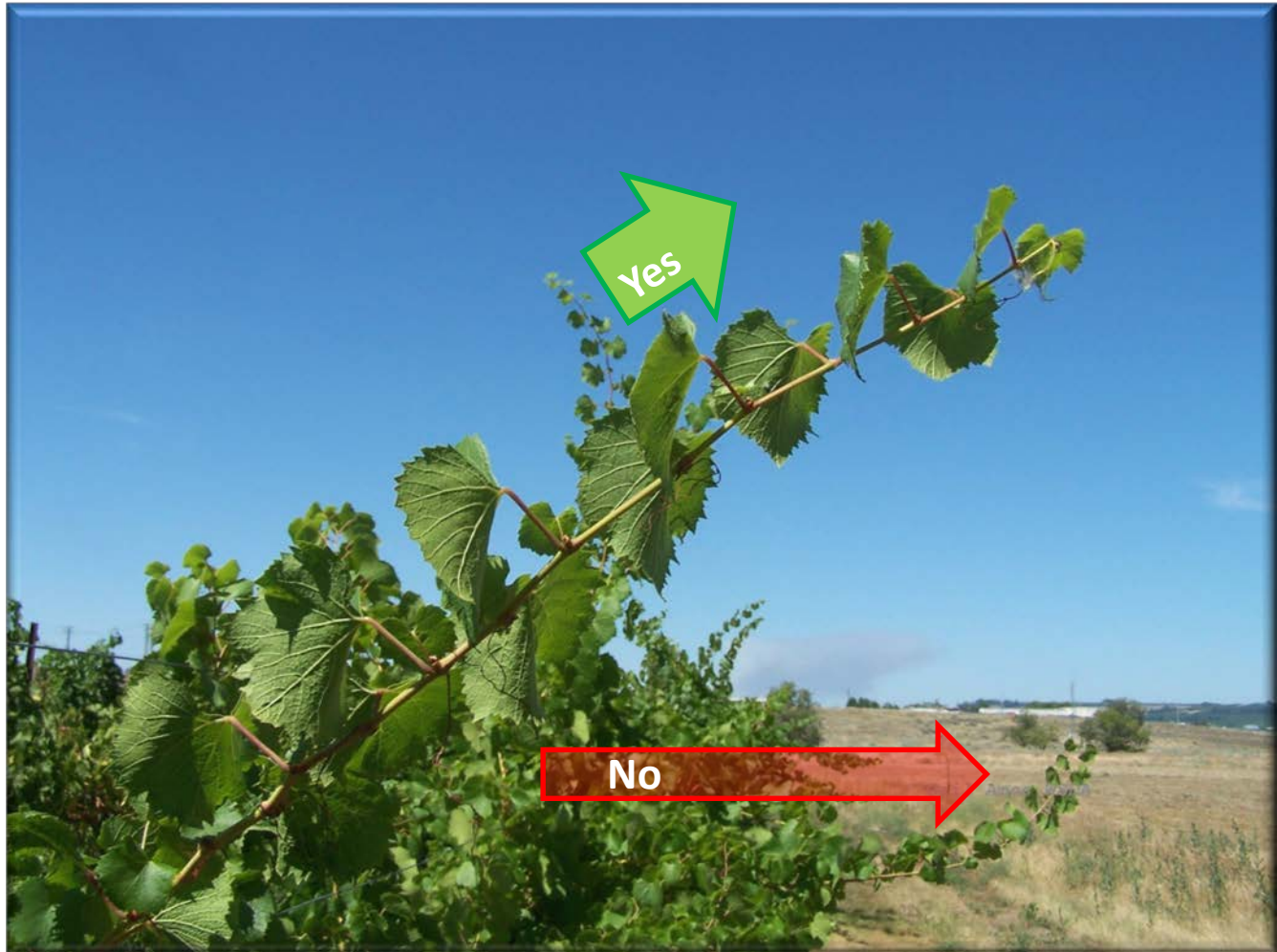
A reference in the row is helpful

A ground reference is helpful when returning to the vineyard, flags are not always the best markers in windy areas.

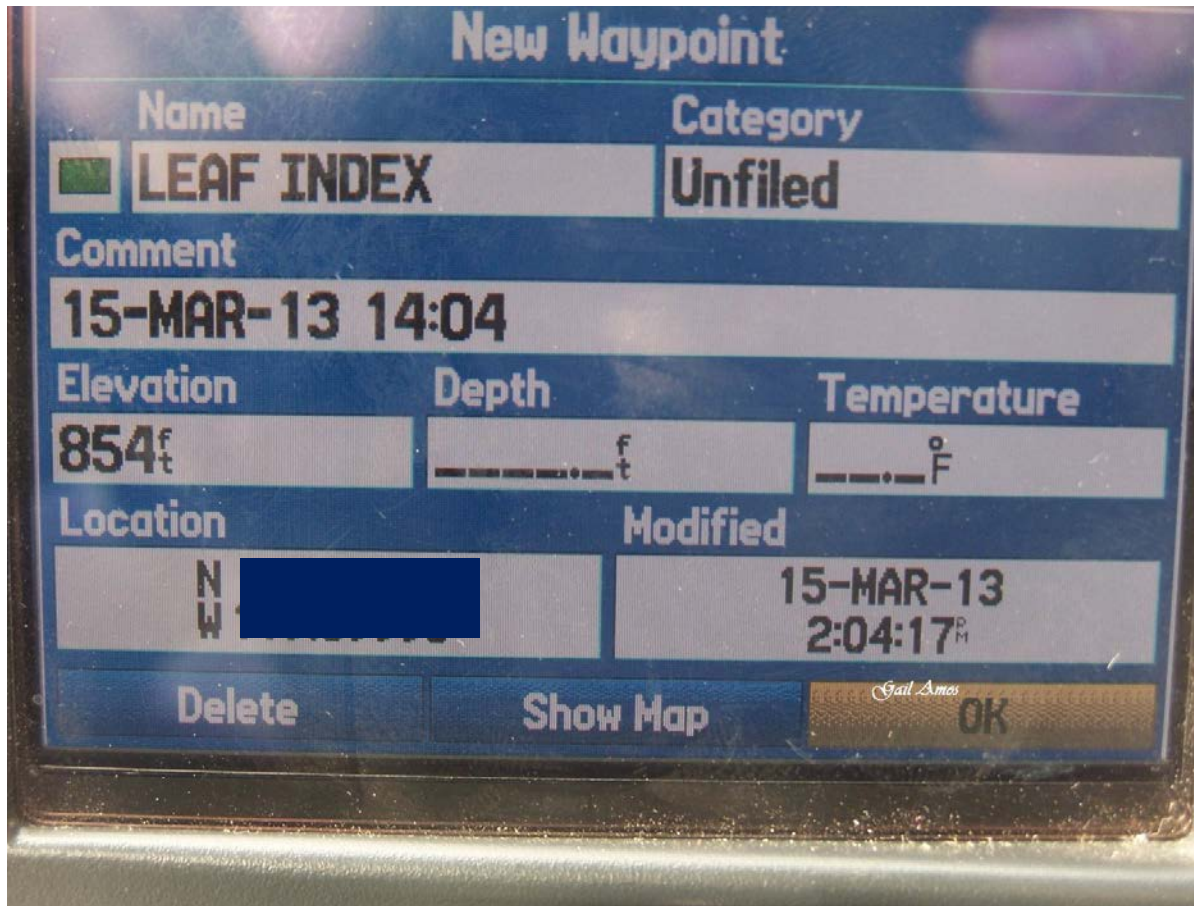


Keep the shoot upright

Horizontal shoots will give false readings as they will not grow out of the symptom as illustrated in the photo.



GPS location is helpful



Inform Crews Not to Disturb Shoot

pruning, thinning, training...



How much time?

- Reading the shoot takes about 5 minutes
- 12 week period starting at bud break
- 12 observation X 5 minutes = **ONE HOUR FOR THE SEASON**
- Note: there is lag time between the exposure and the exhibition of herbicide symptoms
- Take readings same day of each week

Full Time Person at the Vineyard ?

- Most cases investigated by WSDA come about by a good observer working in the field full time and reporting the issue to management .
- An onsite full time person can also record weather events. It is very important to record rain events. There are many isolated showers and only a portion of the vineyard may receive rain.

Selecting an Observer

- Please do not push the observer duty to a field consultant or other service provider to the vineyard. They are not on the property full time and they are there looking for things other than herbicide symptoms.

Remove the Indexed Shoot at the End of the Season for an Historical Record




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