

# FINGER LAKES

## Vineyard Notes



Cornell University  
Cooperative Extension

Newsletter #2

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This is the first of three newsletters that will be coming out over the next several weeks with updates on pest and weed management practices. In this issue, Rick Dunst provides updates on new herbicides and changes to labels that may impact how you use these materials this year, including an important caution with regard to Chateau. Following that, Alice Wise and Libby Tarleton provide some results from a trial examining the impacts of mowing under the trellis versus glyphosate use.

Award-winning grape pathologist Wayne Wilcox (see the article on page 7) will be providing us with his annual disease management update shortly. This newsletter issue, along with the Grape IPM Guidelines, are critical tools for any grape grower in the Northeast. Greg Loeb's update on management of insect pests will then follow sometime in May.

Finally, make sure to register for the annual Spring Grape IPM meeting on Tuesday, May 19, when all of these topics, and more, will be discussed. This is your chance to ask questions, earn some credits, and enjoy some food and wine with fellow growers. More information can found at our website.

### Vineyard Weed Management Update

*Rick Dunst*  
*Research Support Specialist*  
*Fredonia Vineyard Lab*

Viticulture research in Concord indicates that maximum productivity and yield are dependent on adequate vine size. Dr. Terry Bates describes an optimum vine size in typical Lake Erie region vineyards (approximately 600 vines per acre) as being in the range of 2.5 – 3.5 lbs. of dormant cane prunings per vine. Large crops tend to depress vine size below this target, as can competition from weeds and cover crops growing underneath the rows or in row middles. Growers usually don't want to reduce Concord crop size below what can be ripened, so systems have evolved to minimize weed competition during the growing season. On the other hand, wine grape growers often want to restrict crop size to maximize wine quality, as discussed in the article by Alice Wise in this newsletter. Dr. Alan Lakso's research in Concord indicates that demand for water is highest during the period from bloom until veraison, and our weed management programs aim to minimize weed competition during that portion of the growing season. This article will focus on new herbicides and label changes that may be useful to you in minimizing weed competition in your vineyards. A more complete list of herbicides and use guidelines in vineyards can be found in the *2009 New York and Pennsylvania Pest Management Guidelines for Grapes*.

#### *Chateau SW, Chateau WDG*

Chateau (chemical name: flumioxazin) is a broad-spectrum herbicide that controls most common annual weeds in our region and has been registered for use in grapes for several years. (Note: Chateau SW and Chateau WDG are identical formulations of the same product with the same use guidelines, but with different EPA registration numbers. The manufacturer is moving the SW formulation through its sales channels, and will eventually sell only the WDG formulation.) Our program conducted research with Chateau before it was registered, and we had the opportunity for input into registered use patterns. Early on, it became apparent that one of Chateau's limitations is the length of residual activity it can provide, at least in some cases. In our early trials, Chateau was applied at its maximum use rate (12 oz. product per acre) on gravel soils with moderate weed pressure in late April or early May, and it generally provided good weed control through the season. On the other hand, similar applications on heavier soils with higher weed pressure often resulted in less-than-desirable weed control. The label permits two applications at

least 30 days apart, and this approach resulted in much better weed control at the end of the season. Typical application dates are early May and mid-June.

Another successful use of Chateau is delaying application until mid to late May, and tank-mixing with an appropriate post-emergence herbicide for burn down of grapevine suckers and/or emerging weeds. Suitable tank-mix partners with Chateau in vineyards during the growing season include Aim (primarily for grapevine sucker control) and/or Gramoxone or Rely (for burn down of emerged weeds and grapevine suckers). Glyphosate can also be tank-mixed with Chateau, but note the use precaution discussed later in this article. The “take-home” messages are that Chateau continues to provide excellent weed control in area vineyards, and that applications should be split (at least 30 days apart according to label restrictions). Alternatively, if a single application is made, summer weed control may be improved if the application is delayed until later in the spring. Later spring applications generally warrant a tank mix with an appropriate post-emergence herbicide to control emerged weeds (and grapevine suckers, if their control is desired).

There are some label restrictions you should be aware of when considering use of Chateau. These include:

- “Do not apply to grapes established less than 2 years unless they are trellised at least 3 ft. from the soil surface or are protected from spray contact by non-porous wrap, grow tubes, or waxed containers.”
- “Do not apply within 60 days of harvest.”
- “Follow the most restrictive label limitations and precautions of the tank mix product(s) being used.”
- Avoid direct or indirect spray contact to foliage and green bark (non-barked vines), with the exception of undesirable suckers.”

Additionally, the most recent supplemental label for Chateau includes these statements:

- “A maximum Chateau SW rate of 6 oz/A per application should be used on any soil that has a sand plus gravel content over 80% if trees or vines are less than 3 years of age.” This statement may apply to some vineyards planted on light-textured soils in New York and Pennsylvania.
- “New plantings of ‘own-rooted varieties’, such as Concord, should be planted so that all roots are a minimum 8 inches below the soil surface to be treated. In some situations, this may require hilling soil around newly planted vines so that the settled depth of the hill would be 4 to 5 inches above the vineyard floor.” You may recall that in our previous research with Chateau in newly planted Concord vineyards, we sometimes saw

vine stunting from Chateau applications on the gravelly loam soil at the Fredonia Lab.

- “Do not apply during the period after bud break through final harvest, unless using shielded application equipment and applicator can ensure spray drift will not come in contact with crop fruit or foliage. **Shielded applications during this time period should not be made with glyphosate or products containing glyphosate.**” After discussions with representatives from the manufacturer (Valent USA) and the Cornell Cooperative Extension Pesticide Product, Ingredient, and Manufacturer System (PIMS), our interpretation of this statement is that it is a precaution rather than a use restriction. The manufacturer is not liable if you use Chateau in this manner and incur vine injury. Although Chateau is primarily a pre-emergence herbicide, it also has post-emergence activity on many weeds, and it can damage grapevine tissue by direct contact or drift. The combination of glyphosate and Chateau greatly increases damage to contacted fruit and foliage. A few years ago, the product manufacturer asked us to conduct some “simulated drift” studies with Chateau and Chateau tank mixes. Injury or damage to contacted fruit and foliage from Chateau drift was apparent (Figure 1) and the addition of glyphosate to Chateau greatly increased the damage (Figure 2).

*Although Chateau is primarily a pre-emergence herbicide, it also has post-emergence activity on many weeds, and it can damage grapevine tissue by direct contact or drift.”*



*Fig. 1. Injury from Chateau drift into canopy.*



Fig. 2. Injury from Chateau plus Roundup (glyphosate) drift into the canopy

### Aim

Aim (chemical name: carfentrazone-ethyl) has also been registered for use in vineyards for several years. Newer product labels allow application rates up to 2 fl. oz. per application, with a maximum of 7.9 fl. oz. per season. Sequential applications must be made at least 14 days apart. Aim is particularly effective in providing control of grapevine suckers (Figure 3). It can be tank-mixed with other pre- or post-emergence herbicides (as always, observe the most restrictive label precautions of the products being used). Aim also provides post-emergence control of certain small broadleaf weeds, and partial control of weeds beyond the 6-leaf stage. According to the product label, the list of weeds controlled in vineyards with Aim includes some common annual broadleaf weeds such as lambsquarters, pigweed species, and velvetleaf. No control of annual grasses or perennial weeds is claimed. In our experience, control of dandelion with Aim/glyphosate combinations is no better than glyphosate applied alone. If post-emergence control of annual broadleaf weeds (other than those specified on the label), annual grasses, or perennial weeds is desired, tank-mix with another suitable post-emergence herbicide for best results.



Fig. 3. Sucker burn down with Aim herbicide. Note the presence of weeds not controlled with Aim.

### Prowl H20

You may recall that Prowl EC (chemical name: pendimethalin) has been labeled for use in non-bearing vineyards for several years. A newer, water based formulation of pendimethalin, Prowl H20, has been registered for this purpose. More recently, Prowl H20 became labeled for use in bearing vineyards. Finally, the “dormant use only” restriction in bearing vineyards was dropped. Current labeling for Prowl H20 includes the following:

For bearing vineyards:

- “DO NOT apply over the top of grape vines with leaves, or buds, or fruit.”
- “DO NOT apply within 90 days of harvest of fruit.”
- “DO NOT apply more than 6.3 quarts per acre per year (a single growing season).”

For newly planted and one year old (year after planting) vineyards:

- “Apply only to dormant grapevines”
- “DO NOT apply if buds have started to swell. Application after buds have started to swell may result in leaf distortion.”
- “DO NOT apply to newly transplanted trees or vines until ground has settled and no cracks are present.”
- Prowl H20 can be applied in a single application, or 2 applications at least 30 days apart. The maximum use rate for a single application in non-bearing vineyards is 4 quarts per acre. If two applications are made, a total of 6.3 quarts per acre is permitted.

So, where might Prowl H20 fit into your vineyard weed management plan? In two experiments at the Cornell Lake Erie Research and Extension Lab in Portland in 2008, 6.3 qts. Prowl H20 provided weed control similar to that obtained with 12 oz. Chateau. Predominant weed species controlled by both herbicides included horseweed (*Conyza canadensis*, sometimes referred to locally as “marestail”) and large crabgrass (Figures 4 and 5). (A progress report on this project can be viewed at [www.nysaes.cornell.edu/pubs/vitcon/pdf/05.pdf](http://www.nysaes.cornell.edu/pubs/vitcon/pdf/05.pdf)). Prowl H20 is in the dinitroaniline family of herbicides, related to oryzalin (the active ingredient in Surflan and generic oryzalin products). Although we encourage growers to rotate herbicides in their programs to reduce the risk of developing resistant weed species and the buildup of herbicide tolerant weeds, these programs require the rotation of herbicides that are unrelated to each other in order to be effective. Rotating Prowl and oryzalin is not a resistance management strategy. Both Prowl and oryzalin control most annual grasses and some broadleaf weeds. In our experience, ragweed is a common



Fig. 4. Large crabgrass (*Digitaria sanguinalis*) was the predominant weed in Portland, NY experiments in 2008.

weed escape from applications of Prowl or oryzalin. When used for a few consecutive years, we often see a buildup of many biennial and perennial broadleaf weeds such as wild carrot, dandelion and curly dock. Dr. Andy Senesac, Extension Educator in Weed Science at the Long Island Horticultural Research Lab (LIHRL), pointed out that, in his experience, a common occurrence with long-term use of dinitroaniline herbicides is that annual grasses will “break” control earlier in the season. This is similar to the local experience with diuron herbicides (trade name: Karmex) losing effectiveness after repeated applications over many years. Prowl and oryzalin are best used in a rotational program, and tank mixing with an effective broadleaf herbicide can increase the spectrum of weeds controlled. Diuron (trade name Karmex), and simazine (trade name Princep), are among effective tank mix partners. Rotational programs should utilize unrelated herbicides or herbicides with different modes of action. The risk of buildup of annual grasses can be minimized by rotating among several herbicides including Solicam and Devrinol; by controlling “escape” weeds with a systemic grass herbicide such as Poast, or a broad-spectrum post-emergence herbicide such as glyphosate, Rely, or Gramoxone; or by incorporating a post-emergence-only strategy into your weed management program every few years to prevent the production of weed seeds that will result in increased weed pressure in future years.



Fig. 5. Horseweed (*Conyza canadensis*) in Portland, NY ‘Concord’ experiment

One final precaution regarding Prowl H20 should be noted. Although the label now permits applications after dormancy (thus permitting its use later in the spring, perhaps tank mixed with a post-emergence herbicide to control emerged weeds and/or grapevine suckers), pendimethalin formulations are somewhat volatile. According to the [Herbicide Handbook](#) (Weed Science Society of America, Ninth Edition, 2007), activation by rainfall within 7 days of application will prevent appreciable losses.

### Matrix

Matrix (chemical name: rimsulfuron) is a pre-emergence herbicide that recently received federal registration for use in vineyards. AT THE WRITING OF THIS ARTICLE (APRIL 2009), MATRIX IS NOT REGISTERED FOR USE IN NEW YORK STATE AND CANNOT BE LEGALLY APPLIED THERE. Matrix is in the sulfonylurea family of herbicides, and is the first herbicide in that family registered on grapes. Other sulfonylureas are being investigated for future registration.

We had the opportunity to work with Matrix prior to its registration. Matrix has both pre- and post-emergence activity on a fairly broad range of weed species. The label states that a labeled post-emergence herbicide should be included in a tank mix to control emerged weeds, and that Matrix will help provide post-emergence weed control. The label also states that susceptible weeds are controlled for 60 to 90 days after application. In our experience over a few years and under very high giant foxtail pressure, Matrix plus glyphosate applications provided less than 60 days of effective weed control. The low persistence and length of residual weed control with Matrix (as compared with many other commonly used herbicides in vineyards) result in its limited usefulness in vineyard weed management programs. We will continue to include Matrix in our annual herbicide trials to see if we can find a fit, perhaps as a tank mix partner with a longer residual herbicide.

Other points regarding the use of Matrix in vineyards include:

- Broadcast applications are limited to a single application of Matrix FNV at 4 ounces per acre per year, but for banded applications covering less than 50% of the vineyard floor, two applications at 4 ounces per acre are permitted.
- Apply only to healthy vines that have been established at least one year.
- Spray solutions need to be between pH 4 to 8 to avoid degradation.
- Suppression of yellow nutsedge is claimed on the label.

## *Rely 200*

Rely (chemical name: glufosinate) has been registered for use in vineyards for many years. Rely 200 is a more concentrated formulation than the original product. It is a post-emergence herbicide with limited systemic activity; its activity is more comparable to a contact (burn down) herbicide like Gramoxone than a systemic one like glyphosate. Rely controls most annual weeds as well as some biennials and perennials such as burdock, curly dock, and wild onion. Although registered for use in vineyards for many years (note: Rely is not registered for use in Nassau and Suffolk Counties in New York), use in the Lake Erie region has been fairly limited due to its high cost as compared with other products. Some price relief has recently been offered by the manufacturer.

Other points regarding the use of Rely 200 in vineyards include:

- Registered for bearing and non-bearing vineyards, but avoid contact with foliage and green bark on young vines as injury may occur.
- Warm temperatures, high humidity, and bright sunlight improve the performance of Rely. If application of a contact herbicide is warranted when temperatures are cool or when dew is present on the weeds, Gramoxone might be a better choice.
- Unlike Gramoxone, Rely is not a restricted use pesticide.
- Rely can be used for chemical sucker control, but if grapevine suckers are the primary target, Aim will probably provide more effective control.
- With the likelihood that glyphosate resistant weeds will become more common in the future, Rely use may become more important in resistance management strategies.

## *Casoron CS*

Casoron CS (chemical name: dichlobenil) is an “older” herbicide in a new formulation. The original Casoron was a granular formulation. The primary reason for formulation as a granular product was its high volatility (the granular formulation is less susceptible to volatility than most other formulations). The timing of granular Casoron applications was limited to those that would have a better chance of rapid incorporation into the soil (during late fall and winter). These restrictions limited the use of Casoron in area vineyards.

Casoron CS is a water based liquid product in which crystals of the active ingredient are microencapsulated in a polymer membrane, limiting volatility prior to

incorporation. However, the label states “optimal activity will be achieved when applications are made below 70° F to moist soil, and/or followed by rainfall. . .to activate the active ingredient.” An interesting fact about Casoron is that it controls germinating seeds and seedlings of most annual as well as perennial grass and broadleaf weed species including Convolvulus (perennial morningglory and bindweed) species. Our program has no recent experience with Casoron, but we intend to include it in future herbicide trials. For now, interested growers might treat a small portion of vineyard on a trial basis.

## *Summary*

Several herbicides have been registered for use in grapes over the past few years, increasing the options available to growers. Current collaborative studies with Dr. Robin Bellinder, Weed Scientist in the Horticulture Department at Cornell University, and Dr. Andy Senesac, Extension Educator in Weed Science at the LIHRL in Riverhead, bring the potential for additional product registrations, as well as a wealth of knowledge, to the development of effective weed management programs for grapes. The financial support of Cornell University, Viticulture Consortium, Lake Erie Regional Grape Research and Extension Program, New York Wine and Grape Foundation, New York State Wine Grape Growers Association, and product manufacturers, is gratefully acknowledged. Additionally, I would like to acknowledge the thoughtful review of this article by Andy Senesac.

## **Evaluation of Alternative Weed Management Programs in a Vinifera Vineyard**

*Alice Wise, Extension Educator/Viticulturist  
Libby Tarleton, Program Assistant  
Cornell Cooperative Extension of Suffolk County*

## *Summary*

Due to abundant ground and surface waters, Long Island is one of the most environmentally sensitive regions in the U.S. Consequently, winegrowers seek effective low impact and organic methods. To that end, we implemented a trial that evaluated the feasibility of managing weeds under the trellis with a tractor-mounted mower. Growers have been reluctant to try this method due to concerns about competition of weeds with vines. Mowing only was compared to glyphosate only as well as combinations of the two methods. Mowing shifted the spectrum of weeds strongly toward summer annual grasses, particularly crabgrass. There were no impacts, positive or negative, on yield or fruit quality. Any impacts on vine size, health, yield or fruit quality would likely occur only after several seasons. Both

projects provided valuable insights into alternative management regimes which will help fine tune grower practice as well as future research.

### Materials and Methods

In spring 2008, an Edwards (Edwards Equipment Co., Yakima, WA) under trellis mower and mounting frame was purchased with a grant from the Cornell College of Ag and Life Sciences. Replicated plots were established in a block of 13 year old vines cv. Merlot located at the Long Island Horticultural Research and Extension Center. Vines were spaced 8 x 6 and trained to a VSP system. Plots were two to three panels (four vines/panel) in length with four plots per treatment. All treatments focused on management of weeds in the 2.5 ft. strip under the trellis. Credit (NuFarm Inc., Burr Ridge, IL) postemergence herbicide was used, 1 qt./acre equivalent plus 0.0025% NIS, 26 gpa water, 30 psi, 8003LP flat fan nozzle applied in directed sprays with a CO2 backpack sprayer. Vine pest management and canopy management were conducted as per commercial practice.

Cluster thinning to one cluster/shoot took place in early July. To gauge vine nutrient status, petioles were collected postveraison (late August). Weeds were rated monthly through summer and fall using a 1 ft.9 in. x 3.5 ft. PVC frame. Percent weed cover was assessed within the frame, percentages were then categorized into winter annual grasses and broadleaves, perennial grasses and broadleaves, summer annual grasses and broadleaves. Individual species were not counted but were noted.

One hundred berries per plot (4 plots/treatment) were randomly sampled on Oct. 14. Berry weight was determined by weighing the 100-berry samples prior to crushing fruit for analysis. Samples were analyzed at LIHREC for Brix, titratable acidity and pH. Individual vines were harvested on Oct. 15. Crop weight and cluster number per vine were recorded. For each treatment, berries were counted on a random sample of 10 clusters. Data was analyzed using JMP statistical program oneway anova with a Students t test for means separation. Data was transformed prior to analysis.

### Under trellis mowing experiment in cv. Merlot, Long Island, 2008

Treatment		Date of mowing	Date of glyphosate
Mowing only	T.1	May 29, June 17, July 14, Aug. 19	none
Glyphosate only	T.2	none	May 8, June 19, August 13
Mow + glyphosate	T.3	May 29, June 17	July 11
“	T.4	May 29, June 17, July 14	August 13

### Results and Discussion

1. *Petiole results* - Nutrient levels on postveraison petiole samples were similar between treatments.

2. *Weed ratings (Table 1)* - Mowing only plots consistently had the highest weed populations. Glyphosate only plots ranged from weed free to low weed populations. Mowing with single applications of glyphosate resulted in intermediate levels of weeds. The majority of weed pressure was due to summer annual grasses, particularly hairy crabgrass.

Table 1. Under trellis mowing trial cv. Merlot – percent total weed cover, 2008

Treatment	May 19	June 11	July 7	July 28	Aug.10	Sep.11	Oct.10
1 – mow 4x	15.0 ab	36.5	81.0 ab	87.5 a	100 a	94.3 a	100 a
2 – glyph 3x	0 b	22.3	3.8 c	8.1 b	23.4 b	4.6 c	16.0 c
3 – mow 2x, July glyphosate	14.0 ab	32.3	75.0 b	15.0 b	12.8 b	31.3 b	66.3 b
4 – mow 3x, Aug glyphosate	32.4 a	45.4	84.6 a	90.0 a	98.0 a	2.6 c	27.2 c
Significance <sup>1</sup>	0.0039	ns	0.0001	0.0001	0.0001	0.0001	0.0001

1 – Values followed by the same letter are not significantly different.

Table 2. Fruit ripeness parameters and yield components – Merlot, October 15, 2008

	Brix <sup>1</sup>	TA g/l <sup>1</sup>	pH <sup>1</sup>	Berry wt.-g <sup>1</sup>	Berry no./ clust <sup>1</sup>	Clust no./ vine <sup>1</sup>	Crop wt/ vine-lbs. <sup>1</sup>	Avg clust wt-lbs. <sup>1</sup>	Tons/a equiv. <sup>2</sup>
Mowing only	21.6	6.6	3.29	1.7	105.9	15.9	4.9	0.31	2.2
Glyphosate only, 3x	21.2	7.0	3.32	1.7	116.7	16.2	5.3	0.33	2.4
Mow 2x, July glyphosate	21.1	6.9	3.32	1.7	109.0	15.6	4.9	0.31	2.2
Mow 3x, Aug. glyphosate	21.1	6.9	3.29	1.7	103.4	16.8	5.0	0.30	2.3

1 - There was no statistical difference between treatments.

2 – Provided for reference only, data not analyzed.

3. *Harvest data* - There was no significant difference between treatments. Pruning had not been done as of this writing but pruning weights will be documented.

4. *Economics* – Under trellis mowing must be done at a slow speed to minimize trunk damage and to maximize the cut of taller weeds (they bend over with faster ground speeds). Estimated tractor speed with the mower was 1.3 mph. Using a one-sided unit, about 5.6 hours would be required to mow both sides of the trellis in 8 ft. rows. This increases costs substantially as herbicide applications are typically much faster and spray the equivalent of one row per pass.

### Conclusion

Many vineyards control weeds under the trellis with preemergence herbicide, often with one or more postemergence materials such as glyphosate. Under trellis mowing presents an alternative management system, though more labor intensive and expensive. Treatments did not have any impacts on yield components or fruit quality. It is likely however that, if impacts occur, they would be seen in years two and beyond. A smaller berry size in a red winegrape might actually be a desirable impact. Though not reported herein, we have non-replicated plots in two rows of Chardonnay. If long term mowing reduces berry set or size, this may be a benefit as looser clusters are known to be less susceptible to cluster rots.

### Acknowledgements

We would like to thank the following for their support of this work: NY Wine & Grape Foundation Total Quality Focus Program, New York State and Cornell University College of Ag & Life Sciences. A portion of the products were donated by companies.

### Wayne Wilcox Presented the NY Wine & Grape Foundation Unity Banquet Research Award

Dr. Wayne Wilcox, Department of Plant Pathology, NYSAES, Geneva was the 2009 recipient of the NY Wine & Grape Foundation's Unity Banquet Research Award, for major contributions in research and education to benefit the New York grape and wine industry. Wayne serves as leader of Cornell's grape pathology program, Chair of the Food Science Department in Geneva as well as the faculty liaison with the Lake Erie Regional Grape Program. Wayne has been instrumental in developing disease management programs for all grape varieties, especially his work with powdery mildew and phomopsis. In addition to being recognized as a leader in grape disease research, Wayne is also known locally, regionally, nationally, and internationally as someone who can transform the research into extension talks, articles, and newsletters that effect management practice in the grape industry.



## UPCOMING EVENTS

### Hybrid Canopy Management

Tuesday, May 12 3:00 - 5:00 PM

Location TBA

Update on canopy management research for hybrid varieties, including discussion of production costs and tasting of experimental wines.

### Effective Spraying of Vineyards

Thursday, May 14 9:00 - 4:00 PM

Location TBA

Dr. Andrew Landers will present this highly informative one-day course on improving sprayer performance, deposition, drift reduction and more. NY Pesticide recertification credits available. Limited to 20 people. Please register with Linda Davis at [leb15@cornell.edu](mailto:leb15@cornell.edu) or 315-536-5134.

### Finger Lakes Spring Grape IPM Meeting

Tuesday, May 19 3:30 - 6:00 PM, with dinner following

Mike Doyle's farm - 1255 Ridge Road, Penn Yan NY

Agenda for this year's meeting can be found at the [Finger Lakes Grape Program's website](#). Please register with Linda Davis at [leb15@cornell.edu](mailto:leb15@cornell.edu) or 315-536-5134.



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### FINGER LAKES VINEYARD NOTES

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