



UNIVERSITY OF ILLINOIS EXTENSION

College of Agricultural, Consumer, and Environmental Sciences

Illinois Fruit and Vegetable News

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Editors: Nathan Johannang & Bronwyn Aly

A newsletter to provide timely, research-based information that commercial fruit & vegetable growers can apply to benefit their farming operations.

Address any questions or comments regarding this newsletter to the individual authors listed after each article or to its editors, Nathan Johannang, 618-687-1727, njohann@illinois.edu or Bronwyn Aly 618-382-2662, baly@illinois.edu. The *Illinois Fruit and Vegetable News* is available on the web at: <http://ipm.illinois.edu/ifvn/>. To receive email notification of new postings of this newsletter, contact Nathan Johannang at the phone number or email address above.

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Upcoming Programs

Check the **Illinois SARE calendar** for a full list of programs and links for registration.

<http://illinoissare.org/> and <http://illinoissare.org/calendar.php>

Also see the **University of Illinois Extension Local Food Systems and Small Farms Team's website** at:

<http://web.extension.illinois.edu/smallfarm/> and the calendar of events at

<http://web.extension.illinois.edu/units/calendar.cfm?UnitID=629>.

- **High Tunnel Tour, Monday May 9, 2016, 3 – 5 p.m. EST.** Southwest Purdue Ag Center (SWPAC) 4369 N. Purdue Rd. Vincennes, IN 47591. Tour state-of-the-art high tunnels, learn about season extension of strawberry production under high tunnels and early season frost protection by using row covers, and discuss the potential of grafted tomatoes and cucumbers grown in high tunnels. The tour is FREE and call 812-886-0198 to register. For more information contact Wenjing Guan at guan40@purdue.edu.
- **Southern Illinois Summer Twilight Series, 4 Monthly On-Farm Meetings on Mondays, May through August, 6:00 p.m.** For more information or details, contact Bronwyn Aly at 618-382-2662; baly@illinois.edu or Nathan Johannang at 618-687-1727; njohann@illinois.edu Save the dates, more details to follow:
 - **May 16** – All Seasons Farm, Cobden, IL
 - **June 20** – G & C Meyer Farm, near Steeleville, IL
 - **July 18** – Spring Valley Farm, Pulaski, IL
 - **Aug 8** – Grant's Orchard, near Johnston City, IL
- **2016 Illinois Commercial Tree Fruit Twilight Meeting, Thursday, May 19, 2016, 5:30 p.m.** Joe Ringhausen Apple Orchard & Apple House Market, 19770 US Hwy 67, Jerseyville, IL 62052. For more information and to register visit <https://web.extension.illinois.edu/registration/?RegistrationID=14319> or contact Andrew Holsinger at 217-532-3941 or aholsing@illinois.edu.
- **Strawberry Field Night, Wednesday May 25, 2016 5:30 – 8:30 p.m. (Eastern Time).** OSU South Centers, 1864 Shyville Rd. Piketon, OH. Topics to be covered will include: winter protection techniques, israeli drip irrigation demonstration and management, fertigation and nitrogen management, row cover management, June bearing, day-neutral, ever-bearing cultivar evaluations, pest and disease control, Integrated Pest Management

(IPM) techniques, petiole sap analysis demonstration. Cost \$20 and pre-registration is required. To Register Contact Charissa Gardner at Gardner.1148@osu.edu or 740-289-2071 ext.132

- **ISHS Summer Horticulture Day, Thursday, June 9, 8:00 a.m.** Hosted by Raoul & Jodie Bergersen, Valley Orchard, 811 E State St, Cherry Valley, IL 61016. To register online visit <https://www.picatic.com/ilhortday> or contact Rachel Graham Coventry at 217-853-6048 or ilsthortsoc@gmail.com
- **Illinois Pumpkin Field Day, Wednesday, August 31.** Ewing Demonstration Center, 16132 N. Ewing Rd; Ewing, IL 62836. For more information, contact Nathan Johanning at 618-687-1727 or njohann@illinois.edu

Regional Reports

From east-central Illinois ...Here in the eastern-central part of Illinois, vegetable farmers are complaining about the cool, cloudy weather holding back their direct seeded crops out in the fields. Spring greens and radishes are behind normal.



One of our farmers is a large fresh sweet corn producer and this year he invested in a machine that would set hoops and stretch plastic over his early planted corn. He says the low tunnels reach 90 deg. F on cloudy, cool days. The first picture is of the tunnel layer and the second of corn planted the first week of April, with low tunnels installed the second week of April. The farmer is optimistic that there will be fresh sweet corn to sell before July, making it the first to be marketed in the area.



Photos by Doug Gucker.

Doug Gucker (217-877-6042; dgucker@illinois.edu)

More from east-central Illinois...Recent rains have slowed vegetable plantings. Apple and peach crops at the U of I Fruit Research Center at Urbana survived the cold temps of early April with some loss of viable bloom, but we will still have to thin aggressively in both crops. We're now just past petal fall in apples and at shuck-split to shuck-off in peaches. Our biofix date for oriental fruit moth was April 15; we have yet to capture a codling moth in pheromone traps at Urbana. If growers from other locations can provide biofix dates for these two insects, I'll run and summarize models on their development throughout the summer.

Rick Weinzierl (217-244-2126; weinzier@illinois.edu)

From southern Illinois ... Warmer weather has prevailed with highs mainly in the 70s and 80s last week and a little cooler in the upper 60s and 70s this week. We have stayed fairly wet with rain the middle of last week, over the weekend, and into the start of this week which has slowed some field work. I was able to find a field of no-till transplanted summer squash following a crimson clover, cereal rye, radish cover crop. Early maturing cereal rye is now heading out and clover is in full bloom.



Photos by Nathan Johanning.

Plasticulture strawberries are getting into full harvest. Asparagus harvest continues and spears have grown more quickly with the warmer temperatures. My potatoes are up with shoots about 3 inches out of the ridge and some small weeds are not far behind. It will be time to cultivate and hill them very soon. I have found a few early varieties of blackberries in bloom but my 'Dirksen' and 'Black Satin' still have tight flower buds. Early blueberry varieties are nearing the end of bloom while the late season varieties such as Chandler, Liberty, and Elliott are now in full bloom. Table grapes have flower buds and about 4 inches of new shoot growth.

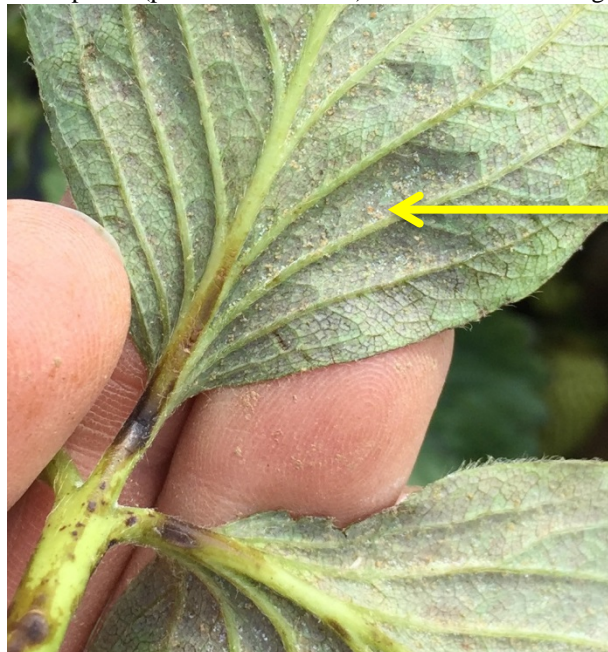
Tree fruit are growing rapidly. Apples are in that 9 to 15 mm range depending on variety and now many growers have started making applications of chemical thinners. Overall, fruit set was heavy so many varieties will need to be thinned in order to have a well-balanced fruit crop this year and prevent biennial bearing in future years. Peaches are around nickel sized or a little bigger and overall the fruit load is also very heavy. My tart cherries at home are loaded and around 3/8 inch in diameter. Hopefully the rest of the week will lead to some dryer and warmer conditions.



Photo by Nathan Johanning.

Nathan Johanning (618-687-1727; njohann@illinois.edu)

More from southern Illinois... After a farm visit last week, I wanted to share a few things that I observed, hopefully to serve as a reminder to all the importance of crop scouting and monitoring. Two-spotted spider mites were seen actively moving in some strawberry plasticulture fields, even after a miticide application had been made the day before. Remember to look on the underside of leaves and bring a magnifying tool, as those like critters are very difficult to see without some type of aid. The topside of some of the strawberry leaves were starting to display the classic “bronzing” look often associated with the presence of mites. With strawberry harvest underway or just about to start, growers need to keep PHI (pre harvest interval) in mind when making chemical control selections.



*Two-spotted spider mites on strawberry leaf.
Photo by Bronwyn Aly.*

In looking at several different blackberry varieties, Choctaw, a very early season producer, was in full bloom while several of the early to mid-season varieties ranged from 10-50% bloom. Just out of curiosity, I started pulling apart blackberry blossoms and discovered thrips, and lots of them. I observed thrips in every blossom I pulled, with some having upwards of 6-8 thrips/blossom. Growers should be aware of these insects, especially matted row strawberry producers who will be approaching bloom soon.



Photos by Bronwyn Aly.

At least two sweet corn plantings have been made in the last month on sites with drier soil conditions with anticipation of harvest prior to the first of July. Traditional field grown tomato transplants are starting to be set out with the hopes of continued warmer temperatures. Conversely, hydroponic greenhouse tomatoes started in February have seen their first couple of harvests.

Bronwyn Aly (618-382-2662; baly@illinois.edu)

News & Updates

USDA Offers New Loans for Portable Farm Storage and Handling Equipment

Portable Equipment Can Help Producers, including Small-Scale and Local Farmers, Get Products to Market Quickly

USDA's Farm Service Agency (FSA) will provide a new financing option to help farmers purchase portable storage and handling equipment. The loans, which now include a smaller microloan option with lower down payments, are designed to help producers, including new, small, and mid-sized producers, grow their businesses and markets.

The program also offers a new "microloan" option, which allows applicants seeking less than \$50,000 to qualify for a reduced down payment of five percent and no requirement to provide three years of production history. Farms and ranches of all sizes are eligible. The microloan option is expected to be of particular benefit to smaller farms and ranches, and specialty crop producers who may not have access to commercial storage or on-farm storage after harvest. These producers can invest in equipment like conveyers, scales, or refrigeration units and trucks that can store commodities before delivering them to markets. Producers do not need to demonstrate the lack of commercial credit availability to apply.

Earlier this year, FSA significantly expanded the list of commodities eligible for Farm Storage Facility Loan. Eligible commodities now include aquaculture; floriculture; fruits (including nuts) and vegetables; corn, grain sorghum, rice, oilseeds, oats, wheat, triticale, spelt, buckwheat, lentils, chickpeas, dry peas sugar, peanuts, barley, rye, hay, honey, hops, maple sap, unprocessed meat, and poultry, eggs, milk, cheese, butter, yogurt, and renewable biomass. FSFL microloans can also be used to finance wash and pack equipment used post-harvest, before a commodity is placed in cold storage.

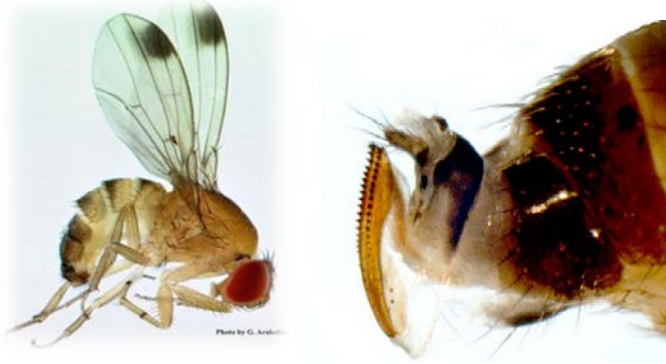
To learn more about Farm Storage Facility Loans, visit www.fsa.usda.gov/pricesupport or contact your local FSA office.

Fruit Production & Pest Management

Update on Spotted Wing Drosophila

Yes, it's still here in 2016, and it will pose a severe threat to production of several fruit crops in Illinois for the foreseeable future. A quick review: SWD was first detected in the US in 2008. It spread rapidly throughout the country and was first recorded in Illinois in 2012. It has been "officially" recorded in counties on the northern and southern tips of the state and in counties on our eastern and western state lines ... I am nearly certain that it is present in all Illinois counties.

Adult male SWD flies have a prominent spot on each wing (hence the name), but the wings of females are not spotted. Females of this species differ from other *Drosophila* species by having an ovipositor (egg-laying organ) that is serrated or saw-like. This characteristic enables them to cut open the "skin" of thin-skinned fruits and lay eggs into them as they begin to ripen. Larvae (maggots) develop with fruits and can be present at harvest; we have collected as many as 50 larvae from a single raspberry that superficially appeared to be just perfect for harvest and sale. It infests a wide range of common fruit crops including blueberries, raspberries, blackberries, peaches, strawberries, cherries, and grapes. We also have reared it from mulberries, elderberries, black currants, Japanese honeysuckle, and pokeweed berries. Infested fruits appear nearly normal at first when larvae are newly hatched and just beginning to feed, but within 36 to 48 hours the fruit begins to "melt down" and collapse, and larvae become clearly visible.



Top: Adult male SWD (left) and ovipositor of female (right). Bottom: SWD larvae in raspberries.

If you grow blueberries, raspberries, blackberries, cherries, peaches, or grapes (or less common fruits such as mulberries, currants, or elderberries), you **MUST** manage this insect unless you plan to eat or sell infested fruit. Where harvest of matted-row or plasticulture strawberries ends before mid- to late June, the crop will likely escape infestation. Similarly, early blueberry varieties may ripen before infestations become common. These escapes occur because numbers of SWD that survive the winter are relatively low, and they appear to become active in mid-June to early July. Populations build up rapidly through the summer (with a little lull in the very hottest weather), and the likelihood of heavy infestations increases through fall. Researchers in the Midwest have captured adult flies in traps into December. SWD flies **DO** enter high tunnels and lay eggs into blackberries, raspberries, and day-neutral strawberries grown in these structures.

A key step in managing SWD is monitoring ... for adult flies and larvae in fruit:

To monitor adult SWD flies, use 1-quart cups with lures and soapy water. You can make traps or buy them ready-to-use from Great Lakes IPM. Some simple instructions for making traps ...

- If you don't want to sort through the soapy liquid in the bottom of the trap, order some sticky yellow cards from [Great Lakes IPM](http://www.greatlakesipm.com) (800-235-0285). Do this first so that they arrive in the mail by the time you've completed steps 2 and 3. See page 22 of the Great Lakes IPM 2016 online catalog ... a package of 25 3" x 5" cards sells for \$8.75. You will cut them in half, so 25 of them will allow you to run 5 traps for 10 weeks. Order a larger number if you need more.
- To make traps, use 1-quart deli cups, preferably clear. (Go to a supermarket with a deli, and if they will not sell you empty containers, buy some potato salad or whatever, and save the container and lid.) Make at least 2 holes near the top of the container so that you can run wire or string through them to hang the containers. Make 8-10 more holes along the side of the container at least 2-3 inches above the bottom ... these will let flies in. The holes should be about the diameter of a number 2 pencil. Use a drill, a paper punch, or a heated metal rod to melt through the plastic. Use a paper clip or a wire to hang half of a yellow sticky card (3" x 2½") from the lid. SWD lures can be purchased from [Great Lakes IPM](http://www.greatlakesipm.com) (800-235-0285). Hang these lures inside the deli cups, and add about 1 inch of soapy water as a drowning agent (make by adding 1 teaspoon of borax plus one drop of unscented dish detergent to a quart of water). You can buy traps already-made if you prefer. Research is ongoing to develop an ideal lure, but the Trecé 2-part lure pictured below is the one I like best so far ... talk with Jim Hansel of [Great Lakes IPM](http://www.greatlakesipm.com) (800-235-0285).
- Hang traps in the shade about waist-high in areas where ripening fruit is present. Check the traps and replace

the liquid weekly. Replace the lures every 4 weeks. If you need help identifying specimens, call me or contact me by email for instructions on sending them in – Rick Weinzierl, 217-244-2126, weinzier@illinois.edu.

- Traps provide indications of SWD population levels but do NOT necessarily provide advance warning of the need for your first spray ... in my observations here and in work in nearby states, infested fruit samples have been collected before SWD adults have been trapped in small fruit plantings. Placing a few traps in adjacent woods may increase the chance of earlier detection, but initiation of sprays or other practices should begin at fruit coloring even if traps have not yet caught SWD adults.



Left: home-made SWD trap; center: close-up of lures and card; right: commercially available SWD trap.

To determine whether or not fruit is infested, immerse a sample of harvested fruit in a fairly high concentration sugar-water solution – 1 cup granulated white sugar per 1 quart water. Within one-half hour (and in fact sooner) larvae will float to the surface. I put berries into small-mesh produce bags and place a washer (weight) on top so that the fruit remains submerged as the larvae float to the surface. The reasons to assess infestations in fruit are two-fold ... one is to determine how effective your control programs have been, and the second more critical reason is to detect infestation before you sell infested fruit to valued customers who did not want to see maggots squirming in it a day later.

So, a summary on monitoring ...

- If SWD was present in 2015, start management with first signs of fruit coloring in susceptible crops in 2016 ... do not wait to catch SWD adults in traps.
- Use traps baited with Trecé 2-part lures. Use yellow sticky cards and soapy water to capture flies. Lures, traps, and cards are available from [Great Lakes IPM](http://www.greatlakesipm.com) (800-235-0285).
- Place some traps in adjacent woods for early detection.
- Assess fruit infestation by immersing fruit in sugar water (1 cup granulated white sugar in 1 quart water) ... larvae will float to the surface.

To prevent infestations or at least limit losses to SWD, a combination of cultural and chemical approaches will be necessary for most growers. Clean picking and frequent picking (and removing damaged fruit) can reduce population buildups within plantings or high tunnels ... not a total solution, but valuable nonetheless. Exclusion by use of screening or fine-mesh netting has been shown to reduce infestations as well. I suspect that other suppliers also provide similar materials, but ProtekNet netting from [Dubois Agrivation](http://www.duboisagrivation.com) is one (1-800-463-9999). In real-world settings, netting is difficult to use and generally will not completely exclude SWD flies, but in conjunction with insecticide applications to the crop, it can be beneficial (as long as it does not lead to too-high temperatures in the high tunnel or within a frame around a small number of plants).

Post-harvest chilling is also important for SWD control ... or at least for suppressing its growth in harvested fruits. Refrigeration will prevent larval growth and slow fruit breakdown.

Insecticides are needed for effective control of SWD. They should be applied to blueberries, raspberries, blackberries, and similar small fruit crops beginning at the onset of fruit coloring and ripening. Preharvest intervals (PHIs) and

recommended application intervals for several insecticides are listed in the table below. Two cautions: (1) Rotate among insecticide modes of action to avoid maximum selection for insecticide resistance (particularly, do not use just Brigade, Danitol, and Mustang Max ... all are pyrethroids). (2) All of these insecticides are at least moderately toxic to bees, and in brambles and strawberries control may be necessary on ripening fruit while later blossoms are still attractive to bees. Where sprays must be applied, use liquid formulations and spray at night when bees are not foraging.

Selected insecticides for SWD control in blueberries, brambles, strawberries, and peaches.

Insecticide	PHI (days) in Blueberries	PHI (days) in Brambles	PHI (days) in Strawberries	PHI (days) in Peaches	Recommended Application Interval ^{1,2}
Brigade (bifenthrin)	1	3	0	Not labelled	5-7
Danitol (fenpropathrin)	3	3	2	3	5-7
Delegate, Radiant (spinetoram)	3	1	1	14	5-7
Entrust (OMRI) (spinosad)	3	1	1	14	3-5
Imidan (phosmet)	3	Not labeled	Not labeled	14	7
Malathion (malathion)	1	1	3	7	3-5
Mustang Max (zeta-cypermethrin)	1	1	Not labeled	14	5-7
Pyganic (OMRI) (pyrethrins)	(12 hours, REI)	(12 hours, REI)	(12 hours, REI)	(12 hours, REI)	1-2

¹ Interval based in part on estimates of residual activity from work done by Rufus Isaacs and in part from observations of effectiveness of spray programs in IL in 2013 and 2014.

² Reapplication of insecticides on shorter intervals is recommended following significant rainfall.

Rick Weinzierl (217-244-2126; weinzier@illinois.edu)

Vegetable Production & Pest Management

Weed Management of Garlic Mustard (*Alliaria petiolate*)

Garlic mustard was likely introduced by settlers into the United States as a culinary and medicinal herb in early 1800's, and was first reported in New York in 1868. This invasive, aggressive and hard-to-destroy weed species is a pain to many vegetable growers in scattered areas in the Midwest and especially where shady conditions are appropriate. Fortunately, with a sustained and dedicated effort, the battle on getting rid of garlic mustard can be won.

Garlic mustard is a biennial that is vegetative in its first year of growth, and is reproductive in the next. It can grow vegetative, that is, when it is pulled from the ground, remnant roots simply start new plants. Plants can also start from seeds. In light infestations, its management therefore requires that it is dug up and the below-ground plant parts removed in their entirety, and that is best done before it goes to seed (a



single plant can produce hundreds of seeds). The uprooted plant material needs to be bagged and destroyed elsewhere. In extensive conventionally-grown gardens, herbicides containing glyphosate can be applied repeatedly as the garlic mustard plants re-start.

Finally, as per Brooklyn Botanic Garden, if you cannot beat it, eat it. Garlic mustard is a delicious vegetable. *Photos by James Theuri.*



James Theuri (815-933-8337; jtheu50@illinois.edu)

Food Safety Updates

Produce Safety Rule: WORKER TRAINING, HEALTH & HYGIENE – article 6 of 7

Requirements for health and hygiene include taking measures to prevent contamination of produce and food-contact surfaces by ill or infected persons. Farm requirements should include instructing personnel to notify their supervisors if they have a health condition that may result in contamination of covered produce or food contact surfaces.

Farm workers who handle covered produce and/or food-contact surfaces, as well as supervisors, office staff, volunteers, and family members, must be trained on certain topics which include the importance of health and hygiene (ie: washing and drying hands thoroughly at certain times such as after using the toilet, before and after eating and smoking, after touching animals, etc.). Farm employees are also required to have a combination of training, education, and experience necessary to perform their assigned responsibilities. This could include training (such as training provided on the job), in combination with education, or experience (ie: work experience related to current assigned duties). Documentation

of required training and corrective actions should be completed. Farms should also establish hygienic practices to prevent visitors from contaminating covered produce and/or food-contact surfaces, for example, by making toilet and hand-washing facilities accessible to visitors.

EQUIPMENT, TOOLS, AND BUILDINGS

The rule establishes standards related to equipment, tools, buildings, instruments and controls (including transportation equipment), pest control, trash, and animal excreta from contaminating produce. This section covers, for example, greenhouses, germination chambers, and other such structures, as well as toilet and hand-washing facilities. It also requires measures to prevent contamination of covered produce and food contact surfaces including, for example, appropriate storage, maintenance and cleaning of equipment and tools.

Farms may store equipment and tools in a manner that is practical but also protects against contamination and prevents attraction and harborage of pests.

Building size, design, and construction must facilitate maintenance and sanitary operations.

Farms must inspect, maintain, clean and sanitize (when necessary and appropriate) all food-contact surfaces of equipment and tools used in covered activities, and to do so as frequently as reasonably necessary to protect against contamination of covered produce.

Farms are required to maintain and clean all non-food-contact surfaces of equipment and tools used in covered activities during harvesting, packing, and holding as frequently as reasonably necessary to protect against contamination of covered produce. The requirements related to non-food-contact surfaces do not require sanitizing (ie: a gear box attached to the brush rollers on a sorting or grading machine that does not come into contact with produce is a non-food-contact surface)

QUESTIONS/COMMENTS:

The Food and Drug Administration has established a Food Safety Technical Assistance Network to provide a central source of information to support industry understanding and implementation:

<http://www.fda.gov/Food/GuidanceRegulation/FSMA/ucm459719.htm>

Laurie George (618-548-1446; ljgeorge@illinois.edu)

Less seriously...

In the spring, at the end of the day, you should smell like dirt. – Margaret Atwood

Tact is the ability to describe others as they see themselves. – Abraham Lincoln

A good farmer is nothing more nor less than a handy man with a sense of humus. - E. B. White

The farmer is the only man in our economy who buys everything at retail, sells everything at wholesale, and pays the freight both ways. – John F. Kennedy

I know of no pursuit in which more real and important services can be rendered to any country than by improving its agriculture, its breed of useful animals, and other branches of a husbandman's cares. – George Washington

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