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THE OHIO STATE UNIVERSITY Newsletter Extension

Fruit ICM News

Volume 4, No. 11
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In This Issue:

Calendar

June 20 & 21: Summer Tour of Farm Markets in NE Ohio and NW Pennsylvania, sponsored by Direct Ag. Marketing Association (DAMA), evening of June 20 and all day on June 21. **Tuesday, June 20**: 6:30 p.m. - Picnic dinner at Whitehouse Fruit Farm, 9249 State Route 62, 4 miles southwest of Canfield, phone (330) 533-4161; 7:30 p.m.- Tour of Whitehouse Fruit Farm. **Wednesday, June 21:** 6:00-7:00 a.m.- Continental breakfast at Whitehouse Fruit Farm; 7:00 a.m.- Bus leaves from Whitehouse Fruit Farm; 7:10 a.m.- Tour Haus Red Apple, Canfield; 8:45 a.m.- Tour Apple Castle Farm Market, New Wilmington, PA; 10:40 a.m.- Tour Soergel's Farm Market, Wexford, PA; 11:40 a.m.- Lunch at Soergel's; 1:30 p.m.- Tour Trax Farms, Library, PA; 3:30 p.m.- Tour Janoski's Market and Greenhouse, Imperial, PA; 5:30 p.m.- Return to Whitehouse Fruit Farm. Cost is $50.00 per person, which includes bus travel, Tuesday evening picnic, Wednesday morning breakfast and Wednesday lunch. To register, contact OSU Extension, Delaware County at (740) 368-1925.

June 28: Ohio Fruit Growers Society Summer Tour, Vogley Enterprises, East Sparta, Ohio, Stark County. Wagon tours start at 8:00 a.m. Dr. Dave Ferree will talk about Apogee, for fire blight and growth regulation. Diane Miller will discuss peach varieties and the Vogley's trickle irrigation system. A walking tour of the processing facilities follows, with Winston Bash (Director of Food Industry Center at OSU) reviewing sanitation and food safety. Exhibitors will sponsor lunch, and Ohio Fruit Growers business meeting starts at 1:00 p.m. Cost is $6 per person or $12 for the family. For registration, contact OFGS at (614) 249-2424 or growohio@ofbflorg so they can prepare the proper number of lunches.

July 27-28: Ohio Berry Tour, Central Ohio. Starts mid-afternoon on the 27th and ends mid-afternoon on the 28th. Tour stops include Rhoads Farm Market (Circleville), Circle S Farms (Grove City), Schacht Farm Market (Canal Winchester), Jacquemine Farms (Plain City), and Doran's Farm Market (New Albany). We will keep you posted as definite times are set and registration information becomes available.

August 3: OVPGA & Ohio Fruit Growers Society Young Grower Tour, Stops at Farmers Produce Auction (Mt. Hope), Graf Growers (Akron), Hilgert's Berry Farm (Mogadore), K.W. Zellers & Sons (Hartville), and Hartville Kitchen.

Licking County Summer Twilight School, stay tuned for details.

Climbing Cutworms on Apple

Source: Dr. Celeste Welty, OSU Extension Entomologist

An economically important infestation of climbing cutworms has been in progress in a commercial apple orchard in Licking County during the past few weeks in several blocks up to 10 miles apart. Climbing cutworms hide underground during the daytime and climb plants at night to feed. As of April 28th, during bloom, many limbs were completely defoliated especially at the top of the trees. The larvae were found in the upper inch of soil and leaf litter under the trees, mostly within one foot of the trunk but some up to 3 feet away. The larvae found last week were about 1.25 inches long with a distinctive pattern of black triangular marks along their back and sides. Injury was less severe in blocks that were sprayed with insecticide (Lorsban) at the pink bud stage than in blocks where no insecticide was sprayed at pink. In blocks where defoliation was severe, 9 to 20 cutworms were found under a tree, whereas in blocks with light defoliation, only 0 to 1 cutworm per tree was found.

If any Ohio fruit growers have noticed the same problem, we are quite interested in documenting the extent of the problem and identifying the species. Please contact C. Welty (phone 614-292-2803, or e-mail welty.1@osu.edu) or a county extension agent with any reports.

We do not have a final species identification yet on the larvae collected last week, but we are fortunate in having a USDA caterpillar expert nearby, who thinks that it is *Agnorisma (formerly Xestia, formerly Amathes, formerly Agrotis) badinodis*, known unofficially as the spotted-sided cutworm. This species was reported by Roy Rings as the cause of a serious infestation in apples in Guernsey County in 1967. This species has only one generation per year; the larvae are now in the seventh instar and are nearly full-grown. They will soon pupate in the soil and emerge as adults (moths) in September, when they will lay eggs and go through two larval instars before overwintering. Larvae are known to feed on chickweed and dock. We hope to confirm the species identification once the adults emerge. There are at least 37 known species of climbing cutworms! Many of these species have been reported as occasional pests of apple and peach trees.

No firm scouting or threshold guidelines for climbing cutworms have been found. Scouts could follow a general pre-bloom scouting procedure used for fruitworms and leafrollers: look at 10 fruit clusters on each of 10 trees and treat if more than 5 infested or damaged clusters are found. It appears that application of an insecticide at the pink bud stage, preferably applied at night, controls most of the problem. Climbing cutworm is listed as a target pest for apples on the Lorsban 50W and 4E labels.

Peach Diseases Initiated After Petal Fall

Source: Dave Rosenberger, Plant Pathology, Cornell University, Highland, NY

Rusty spot, peach scab, and bacterial spot are peach diseases that occur only sporadically in New York State, but they cause severe losses when they do appear. All three of these diseases are initiated at or shortly after petal fall. Peach scab and bacterial spot are more severe in New Jersey and other southern states than they are in New York. Peach scab and bacterial spot occur in the Hudson Valley in years following unusually mild winters or when spring conditions are especially conducive to disease development. All three diseases can be prevented with fungicides or bactericides.

Rusty spot is believed to be caused by *Podosphaera leucotricha*, the same fungus that causes powdery mildew on apples. Rusty spot appears as large, rust-colored spots on the sides of green peach fruit. It is best prevented by locating peach plantings away from mildew-susceptible apple cultivars that provide the inoculum for infections on peach. Thus, peaches should never be planted adjacent to mildew-susceptible apple cultivars such as Ginger Gold, Cortland, Rome Beauty, or Idared. Warm, dry weather conditions that favor powdery mildew on apples will also favor development of rusty spot on peaches.

If rusty spot is a problem in existing plantings, it can be controlled by applying mildewcides starting at shuck split. Sulfur is probably the most cost-effective mildewcide for peaches, although the SI fungicides registered for controlling brown rot will also control rusty spot. Fruit become more resistant to rusty spot Ohio Fruit ICM News after pit hardening, but additional infections may occur after pit hardening if peaches are grown in an area with high levels of inoculum.

Peach scab, caused by *Cladosporium carpophilum*, overwinters in lesions on peach twigs and as spores on the bark. The fungus causes velvety brown spots to develop on peach fruit. Scab is more severe in southern areas than in the northeast. In the northeast, spraying for peach scab is unnecessary in most years. However, scab occasionally causes considerable damage in orchards left unprotected after shuck split. Peach scab is easily prevented by applying fungicides from shuck split until early July. Sulfur added to several cover sprays is the cheapest and most cost-effective fungicide for controlling peach scab. As an alternative, one spray of Bravo applied at shuck split to control brown rot will probably provide full-season control of scab in the northeast.

Bacterial spot is caused by the bacterium *Xanthomonas campestris* pv. *pruni*. Bacterial leaf spot is rarely a significant problem in New England and New York (except for Long Island), but can cause significant losses in peach orchards in some years. *X. pruni* infects leaf scars on twigs as leaves drop in the fall, then initiates infections the next year if spring weather conditions favor infection. Infections on green fruit cause the fruit to secrete gum. Multiple infections can cause the fruit to crack as they ripen. Infections on leaves are often most numerous on the edges and lower half of the leaf because the bacteria are carried to the lower half of the leaf during rains. Severely affected leaves turn yellow and drop prematurely. Infected leaves supply inoculum for further infections of fruit.

The best control for bacterial spot is to avoid planting varieties that are highly susceptible to this disease. Where susceptible varieties are already planted, bacterial leaf spot can be reduced by applying a copper spray at leaf fall in autumn to reduce overwintering populations of the bacteria. The primary control for susceptible cultivars is application of Mycoshield (terramycin) at 10 to 14-day intervals between shuck split and fruit ripening.

Treat a Peach

Source: Art Agnello, Entomology, Cornell University, Geneva, NY, Scaffolds Fruit Journal

Oriental Fruit Moth: The first oriental fruit moth (OFM) catches in Niagara and Orleans Counties were recorded early last week, just as the earliest peaches there were reaching the pink bud stage. This insect, native to China, was introduced into the U.S. from Japan about 1913 on infested nursery stock. The OFM is now found in all regions of North America where peaches are grown. Although it is most important as a pest of peach, the OFM has an extensive host range that includes apple, quince, pear, plum, cherry, apricot, nectarine, and some rosaceous ornamentals. In the northeastern U.S., the OFM has three generations (flights) per year. In areas with a longer growing season, it may have up to five generations per year.

On peach, the OFM feeds in both vegetative growth and fruit. The first generation, which is feeding when terminals are succulent and tender, develops almost exclusively in the vegetative growth. The larvae often enter the terminal at the base of a young leaf, and tunnel toward the base of the shoot. Infested terminals wilt and die back to the margin of feeding, and are commonly called "strikes" or "flagged shoots". Heavy twig infestations of nursery stock can adversely affect the shape of the tree. Axillary buds often begin to grow when the terminal shoot is killed, causing the tree to have a bushy appearance.

Fruits that are infested when very small often drop. Early infested peaches that do not drop have obvious entrance holes with frass and gum exuding from them. Larvae attacking nearly ripe peaches usually enter the fruit near the stem, leaving only a very small, inconspicuous entrance hole. The larvae tunnel in the fruit, and frequently excavate cavities near the pit.

Terminal feeding on apple is similar to that on peach. Infested apples have a collection of frass at the exit hole of the insect's feeding tunnel, or at the calyx end. It is difficult to distinguish between OFM damage and codling moth damage. OFM larvae feed randomly in the apple and usually do not feed on the seeds, while codling moth larvae usually tunnel directly to the core Ohio Fruit ICM News of the apple and feed on the seeds. Later instar larvae of the two species may be distinguished by the presence or absence of the anal comb at the tip of the abdomen. The anal comb is present in the OFM and absent in the codling moth.

More than 130 species of parasitoids have been reported attacking OFM; however, parasitism probably plays a very minor role in OFM control in today's commercial orchards because of the sensitivity of many parasitoids to commonly used insecticides. Research on mating disruption of OFM has shown that if a synthetic sex pheromone is released in high concentrations, male oriental fruit moths cannot locate a female to mate. However, this approach is not generally justified in N.Y. against the first generation, which corresponds with the period of plum curculio and

early tarnished plant bug control. It may be a practical alternative to pesticides for the 2nd and 3rd broods if 2-3 sprays are normally applied to control this pest, and if no other insecticide sprays are routinely needed for other pests after shuck split. We will be examining the efficacy of this approach using various pheromone dispensing systems in western N.Y. this season. For most commercial blocks, where 2nd brood larvae threaten fruits as they ripen, an application of carbaryl (Sevin) is commonly recommended 2 weeks before harvest or, for those depending on scouting results, when larval numbers reach 1 per 10 terminals.

Recent complaints of ineffective control in some peach blocks having more severe pressure (particularly in far western N.Y.) may indicate either a failure to take care of the early larvae sufficiently, or else a growing resistance problem. The recommendations from Ontario, where OFM is a more serious problem, are to spray about a week after the peak of both the first and second flights (usually between petal fall and shuck split, and early to mid-July, respectively), possibly following up with a second application in each case. In recent years, some tolerance or resistance tendencies have been noted in local populations, so this is a case where rotation to alternative chemical classes would be recommended; choices would include Guthion or Imidan, Sevin, Lannate, or a pyrethroid. (Adapted from Oriental Fruit Moth Fact Sheet #17, by A. J. Seaman and H. Riedl).

Green Peach Aphid: The green peach aphid (GPA), *Myzus persicae*, is an important pest of many horticultural and agronomic crops. It was introduced from Europe many years ago and is now found throughout most of North America. This aphid has a host range of over 800 plants. It attacks all stone fruits including peach, nectarine, plum, apricot, and cherry.

The GPA has two basic forms, winged and wingless. Winged forms are all adults and each have a yellowish-green abdomen with a black head and thorax (where the wings are attached). The wingless forms of nymphs and adults are light green or yellowish-green with three darker lines on the abdomen. Both forms are pear-shaped, have long antennae, and two cornicles extending from the posterior end of the body. Eggs are shiny black and oblong.

The GPA has a unique and complicated life cycle. In the mid-Atlantic region, the GPA can overwinter as asexual wingless females in protected areas on the tree. In colder climates, it overwinters in the egg stage near buds of stone fruit. The first appearance of GPA occurs around bloom after the females emerge from their protected sites or the eggs hatch. The GPA then undergoes 2-3 generations of asexual reproduction with wingless females giving birth to living young. This form of reproduction occurs without mating and only females are produced at this time. During the period from shuck-fall to 4-6 weeks later, asexual winged females are produced, which fly to alternate host plants, where they start producing asexual wingless females. Wingless females are the norm during the summer but winged females can be produced if host plant conditions deteriorate or aphid colonies become too crowded. In the fall, winged females are produced, which disperse back to stone fruit and produce a generation of wingless females for overwintering. In the colder northern areas, winged sexual males and females are produced, which disperse to stone fruit where mating commences and overwintering egg laying occurs.

GPA damage to stone fruit is caused by feeding on leaves and fruit. Damage to peach is primarily limited to honeydew marking, fruit distortion, uneven coloring at harvest, and curled leaves. In most years, GPA damage to peach is minimal, but in bad years damage to peach is readily noticeable. However, damage to nectarine can be quite severe because GPA feeds more readily on nectarine than on peach fruit. Stone fruit damage occurs during the spring before theOhio Fruit ICM News aphids disperse to alternate host plants. Early feeding damage on fruit appears as dark green spots, which increase in size as the fruit grows. As the fruit starts to color, the green spots turn brown and necrotic, while the background color surrounding damaged areas remains off-color. Extensive GPA feeding will cause fruit cracking.

This pest's importance has increased with the recent discovery of Plum Pox Virus in Pennsylvania, because GPA is one of the primary vectors of this disease. Currently, most of the information on aphid vectors of PPV comes from literature in Europe where this virus has caused extreme devastation of the stone fruit industry. Among other aphid vectors found in N.Y. are *Aphis craccivora*, cow pea aphid; *A. spiraecola*, spirea aphid (very common, especially on apples, grasses); *Brachycaudus persicae* (Passerini), black peach aphid (very common); and *B. cardui*, the thistle aphid.

Peach terminals should be inspected on a regular basis after petal fall for the presence of green peach aphid colonies. In light of GPA's role in transmitting Plum Pox Virus, a zero tolerance to this pest should now be considered in stone fruit plantings. Lannate and Thiodan have been less effective in controlling these aphids than they once were. However, Provado has just received a Section 18 label in peaches and other stone fruits for this use.

Apogee Offers Approved Control of Growth and Fire Blight

Source: David C. Ferree, Horticulture & Crop Science, OSU, OARDC, Wooster, OH

Apogee is an antigibberellin material that we have experimented with for several years to evaluate its potential to control growth. Generally we have achieved about a 30% reduction in shoot growth (Golden Delicious, Empire, Melrose, Fuji), which resulted in a more open canopy that improved spray penetration. This degree of growth reduction was not excessive, as occurred with several of the earlier antigibberellin materials we tried. We did not have any adverse effects on fruit size or quality, except one year we found some fruit cracking on Empire. Reports from other areas have not identified any problems with fruit finish.

Although we have tried multiple or split applications, they have not performed better than a single application of 250 ppm applied when shoot growth is 2-3 inches. Trees treated with Apogee have shown less development of fireblight in trials in Michigan, New York and Pennsylvania. In one year of our studies we had a fireblight in only one area of the orchard that involved only one replication of the series of treatment on Golden Delicious. On those few trees the effects were striking, with few strikes on Apogee treated trees and many strikes on the untreated control.

Apogee can be a very helpful tool when excessive shoot growth or a high potential of fireblight may exist. It may be particularly beneficial if the crop is lost on young trees and some help is needed to keep the tree's growth under control. We are continuing our studies and plan to discuss the results at the summer meeting of OFGS.

Early Emergence of Codling Moth

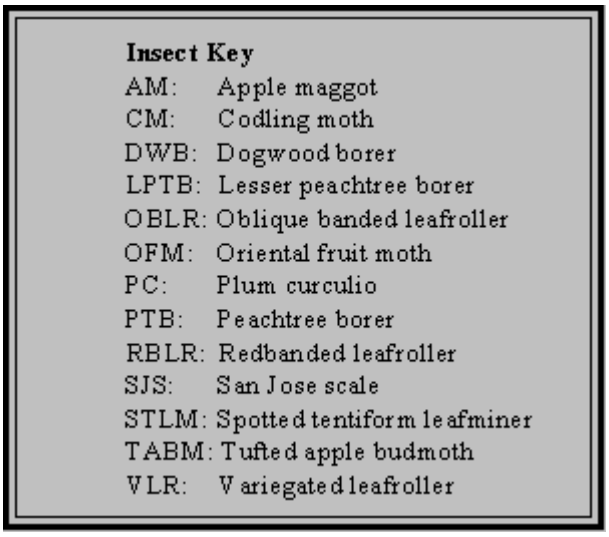
Source: "The Codling Moth in Ohio", C.R. Cutright, Research Bulletin #969, Sept. 1964

Historically, we have no reason to expect to find codling moth in the east district in north central Ohio this week; however, earlier research by Dr. C. R. Cutright, former Professor, Dept. of Zoology & Entomology, OARDC, indicated that ". . . temperature is the most important factor that influences codling moth behavior." Depending on temperature, he showed that the emergence of the spring generation occurred during a period as short as 14 days and as long as 56 days. The summer brood emerged during a period of 32 to 75 days. A standard spray schedule based only on the calendar does not account for these wide variations in the presence of the codling moth adult.

At Wooster, Ohio, moths have begun emergence as early as May 1 and in one instance as late as May 31. Emergence has ended as early as June 8 and as late as July 10. Peak emergence has occurred as early as May 6 and as late as June 5. Once underway, emergence continues from 6 weeks to 2 months.

Northern Ohio generally lags behind the Wooster location in degree day accumulations, therefore we find this early catch unusual. See Fruit Observations.

Fruit Observations



Site: Waterman Lab, Columbus (4/27-5/2)
Source: Dr. Celeste Welty, OSU Extension Entomologist
Traps used: STLM=wing traps, SJS=Pherocom-V, Others=Multipher® traps

Apple	**Peach**
RBLR: 0 (unchanged)	OFM: 0 (unchanged)
STLM: 25 (down from 43)	LPTB: 0 (unchanged)
DWB: 0 (unchanged)	PTB: 0 (unchanged)
SJS: 0 (first report)	
CM: 1.3 (up from 0)	
OBLR: 0 (first report)	
TABM: 0 (first report)	
VLR: 0 (first report)	

Site: East District; Erie & Lorain Counties (4/27-5/3)
Source: Jim Mutchler, IPM Scout
Traps Used: STLM=wing traps, Others=Multipher® traps

Apple	**Peach**
RBLR: 9.4 (down from 11.5)	OFM: 0.67 (down from 1.9)
STLM: 730 (up from 675)	RBLR: 12.2 (down from 27.2)
CM: 4.4 (first report)	

SJS: 0 (first report)

Fruit development: Apple-blossom to early petalfall.

Site: West District; Huron, Ottawa, & Sandusky (4/26-5/2)
Source: Gene Horner, IPM Scout
Traps Used: STLM=wing traps, Others=Multipher® traps

Apple	**Peach**
RBLR: 12.2 (down from 29.3)	OFM: 7.25 (up from 1.25)
STLM: 135 (down from 513)	RBLR: 20.3 (down from 25)

Beneficials at work: Banded thrips, predatory wasp

Site: Licking County
Source: Howard Siegrist, Extension Agent

Central Ohio peach crop - appears to be a very large crop. Thinning will be in order in a few weeks. Apple set is still uncertain. Bloom was somewhat spotty and light in some areas.

Site: Wayne County (4/27-5/3)
Source: Ron Becker, Extension Program Assistant
Traps used: STLM=Wing traps, PC=Circle trunk trap, Others=Multipher® traps

	Apple			
	North	South	East	West
RBLR:	24	63	5	34
STLM:	300	30	0	250
PC:				0

	Peach		
	North	East	West
OFM:	1	12	15
LPTB:	0		0

Other observations: No scab infection indicated by orchard monitors. Light to moderate fire blight infection indicated in orchards with fire blight last year. Orange rust now being in black raspberries.

Beneficials at work: Lady bugs and banded thrips

Northern Ohio Apple Scab Activity - SkyBit Product

SkyBit based on observations:	May 1 & 2; possible infection & damage
Based on Forecasts:	**May 7-10; possible infection & damage**

North Central Ohio Spectrum Technologies Orchard Monitors for Apple Scab
Spectrum Technologies Monitors and Software* Observations: May 1 & 2; Light Infections
(Software* based on Modified Mills Chart)

Northern Ohio Fire Blight Activity - SkyBit Product

SkyBit based on observations:	May 1; possible infection & damage
Based on Forecasts:	**May 7-10; possible infection & damage**

Degree Day Accumulations for Selected Ohio Sites January 1, 2000 to date indicated

	Actual DD Accumulations May 3, 2000		Forecasted Degree Day Accumulations May 10, 2000			
Location	**Base 43° F**	**Base 50° F**	**Base 43° F**	**Normal**	**Base 50° F**	**Normal**
Akron - Canton	425	160	530	476	223	228
Cincinnati	617	269	754	762	361	395
Cleveland	395	143	495	449	202	215
Columbus	584	250	703	585	325	291
Dayton	563	233	685	594	311	300
Mansfield	410	154	513	464	215	222
Norwalk	401	139	502	429	199	205
Toledo	419	141	521	416	201	198
Wooster	470	187	569	437	245	201
Youngstown	413	151	508	422	206	199

Phenology

	Range of Degree Day Accumulations	
Coming Events	**Base 43° F**	**Base 50° F**
San Jose scale 1st catch	189-704	69-385
Lesser peachtree borer 1st catch	224-946	110-553
White apple leafhopper nymphs present	236-708	123-404
Oriental fruit moth 1st flight peak	259-606	96-298
First codling moth catch	273-805	141-491

Spotted tentiform leafminer sap-feeders present	295-628	130-325
European red mite egg hatch complete	361-484	183-298

Thanks to Scaffolds Fruit Journal (Art Agnello)

Preliminary Monthly Climatological Data for Selected Ohio Locations April 2000

Weather Station Location	Monthly Precip.	Normal Monthly Precip.	Year-to-Date Precip.	Normal Year-to-Date Precip.	Avg. High	Normal High	Avg. Low	Normal Low	Mean Temp.	Normal Mean
Akron-Canton	5.18	3.16	12.25	10.88	58.0	59.1	38.0	37.9	48.0	48.5
Cincinnati	4.27	3.75	17.77	13.27	63.4	64.2	41.1	42.2	52.3	53.2
Cleveland	3.72	3.14	9.98	10.28	55.8	57.9	38.1	37.3	47.0	47.6
Columbus	4.15	3.21	13.12	10.90	61.7	62.0	40.7	40.0	51.2	51.0
Dayton	4.19	3.46	11.75	11.18	61.5	61.9	40.3	40.5	50.9	51.2
Mansfield	4.38	3.64	12.23	10.94	58.0	58.6	37.2	38.1	47.6	48.4
Norwalk	3.22	3.13	10.47	9.53	57.0	57.7	36.2	36.6	46.6	47.2
Toledo	3.55	2.96	8.17	9.10	58.5	58.8	37.8	36.4	48.2	47.6
Wooster	3.89	3.06	10.5	9.90	60.1	59.6	38.0	36.7	49.1	48.1
Youngstown	4.58	3.06	10.58	10.33	57.8	57.7	37.5	36.8	47.7	47.3

Temperatures in degrees F, Precipitation in inches

Table Created by Ted W. Gastier, OSU Extension, from National Weather Service, OARDC &; Local Data

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information that is complete, timely, and accurate, the pesticide user bears responsibility of consulting the pesticide label and adhering to those directions.

Keith L. Smith, Associate Vice President for Ag. Adm. and Director, OSU Extension.

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