



# UNIVERSITY OF ILLINOIS EXTENSION

College of Agricultural, Consumer, and Environmental Sciences

## *Illinois Fruit and Vegetable News*

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*a newsletter for commercial growers of fruit and vegetable crops*

*"We are what we repeatedly do. Excellence, then, is not an act, but a habit." Aristotle*

Address any questions or comments regarding this newsletter to the individual authors listed after each article or to its editor, Rick Weinzierl, 217-333-6651, [weinzierl@uiuc.edu](mailto:weinzierl@uiuc.edu). The *Illinois Fruit and Vegetable News* is available on the web at: <http://www.ipm.uiuc.edu/ifvn/index.html>. To receive email notification of new postings of this newsletter, call or write Rick Weinzierl at the number or email address above.

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### *Upcoming Programs*

- **Illinois Pumpkin Field Day at the University of Illinois St. Charles Horticulture Research Center, September 11, 2007.** For information, contact Bill Shoemaker at 630-584-7254 or [wshoemak@inil.com](mailto:wshoemak@inil.com).
- **Exploring Local Food Systems:** The Lumpkin Family Foundation (Mattoon), along with the Delta Institute and the Wallace Center at Winrock, invites farmers from Champaign, Christian, Clark, Coles, Cumberland, Douglas, Edgar, Effingham, Fayette, Macon, Montgomery, Moultrie, Piatt, Shelby, Sangamon and Vermilion counties to a evening devoted to exploring local food system development. There is booming demand for locally produced food that provides potential opportunities and challenges for farmers and food companies. Local markets exist around these counties, and relatively large markets such as St. Louis, Indianapolis, and Chicago are not far away. This program seeks to learn about growers' experiences in production and marketing for more localized markets: What have your successes been and what are your needs? Are existing supporting infrastructure and resources adequate? What needs might you identify? If you are considering this market, what do you need to succeed? Would you like to learn more about demand for local foods in the regional market? Are you interested in diversifying your farm? What are the economic opportunities for local food? We would like to hear from you. Please join us for dinner and discussion the week of October 15th. Times and locations will be announced later in September. If you are interested in attending or would like more information, please call Mari Coyne at 847-830-8948 or email her at [farmforager@yahoo.com](mailto:farmforager@yahoo.com).

### *Regional Updates*

**In southern and southwestern Illinois**, it's still hot and dry. Very isolated showers provided temporary relief for a lucky few. Gala apple harvest is finished, with Jonathon and Yellow Delicious just starting. All but the latest peaches such as Parade have been harvested. Predation by wildlife has been a serious problem on most crops this year due to drought and an overall lack of food sources following the Easter freeze. Grape varieties are coming in early and closer together than normal. Norton, which is normally late, will most likely be harvested before Chambourcin in the more southern growing areas.

Pumpkins are maturing early as well, and many growers are facing an early harvest in areas where deer predation is a serious problem. For growers who need to harvest early this year, pumpkins can be stored for a few months with good storage conditions. The optimum storage temperature range for pumpkins is 55-59°F. Moderate relative humidity with good ventilation is essential for optimum storage, somewhere between 50-70% RH with 60% usually considered optimum. Higher humidity will promote decay. Although 50-70% RH will reduce decay during storage, significant weight loss will still occur. Chilling injury can occur if pumpkins and squashes are stored below 50°F. Symptoms of chilling injury are sunken pits on the surface and high levels of decay once fruit are removed from storage. Keep the surface of the fruit dry to prevent or retard growth of decay fungi and bacteria. Fruits can be sprayed or dipped with a 10% bleach solution to further reduce any surface pathogens. Fruit should be thoroughly dry/dried following treatment before going in cold storage. Air circulation helps to prevent moisture from forming on the surfaces of the fruit, so avoid stacking fruit. Avoid storing fruit on cold concrete floors—moisture tends to condense on fruit. Promptly discard any fruit that shows signs of decay. Do not store pumpkins or squash near apples, pears, or other ripening fruit.

*Elizabeth Wahle (618-692-9434; [wahle@uiuc.edu](mailto:wahle@uiuc.edu))*

**In northern Illinois**, the last 2 weeks have seen daytime high temperatures in the 70s to low 90s, with night-time lows in the upper 50s to low 70s. The area received 2-5 inches during this period, with Rockford, DeKalb, and the northwest Chicago suburbs getting over 4 inches. The Kankakee area also received about 4 inches of rain over the last 10-14 days. Water is still standing in parts of some farms.

Orchardists are encouraged to scout and use disease-forecasting software for apple scab and other diseases, and shorter spray intervals may be needed to ensure good disease control, especially if fungicides are washed off by rainfall. It's also time to increase calcium chloride sprays to 12 lb/acre to control cork spot, bitter pit, and Jonathan spot in apples. Picking of early apple varieties such as Red Free, Pristine, William's Pride, Ginger Gold, and Prima is going on in pick-your-own apple orchards, and picking of peaches and raspberries continues where these crops are grown in the region.

Harvesting of sweet corn, muskmelons, watermelons, tomatoes and other vegetables continues. Corn earworm moth counts are moderate to high, at least at a few locations. On tomatoes and peppers I have observed sun scald on fruits, bacterial spot, and bacterial canker on some tomato fruits. Western corn rootworm beetles and cucumber beetles are a problem in vine crops and other vegetable crops such as sweet corn, and growers are encouraged to scout their fields and spray when necessary. In pumpkins and squash, mosaic virus on new growth was observed in some farms, as well as powdery mildew. Phytophthora infection on vine crops and peppers was very common in farms that have been flooded. I also observed cucurbit fruit rots, particularly in pumpkins and summer squash, angular leaf spot on muskmelons, and leaf rust on sweet corn.

*Maurice Ogutu (708-352-0109; [ogutu@uiuc.edu](mailto:ogutu@uiuc.edu))*

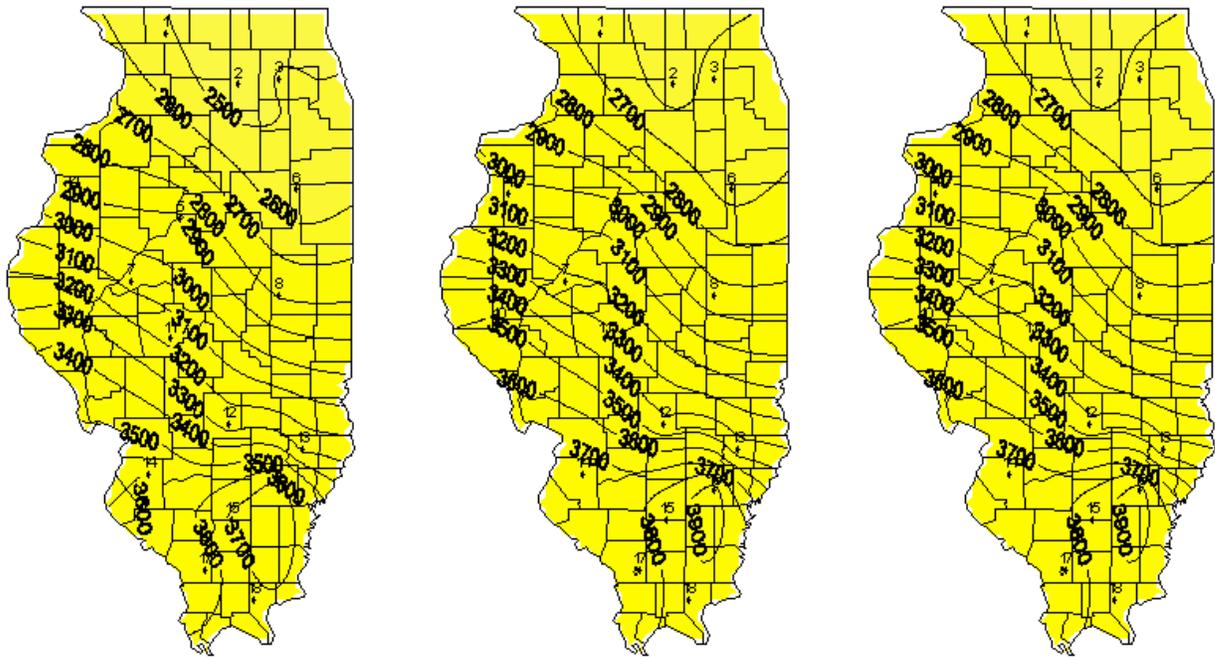
### ***New IPM Educator in Southern Illinois***

Doug Jones began work on August 6 at the University of Illinois Mt. Vernon Extension Center. He has M.S. and Ph.D. degrees from Oklahoma State University and worked for 9 years as an extension assistant and school IPM coordinator there as well. Doug can be reached at [jonesd@uiuc.edu](mailto:jonesd@uiuc.edu) or 618-242-9310.

### ***Degree-day Accumulations***

Degree-day accumulations listed below for weather stations in the Illinois State Water Survey WARM data base have been summarized using the Degree-Day Calculator on the University of Illinois IPM site (<http://www.ipm.uiuc.edu/degreedays/index.html>). The list below includes only degree-day accumulations and projections based on a 50-degree F developmental threshold and a January 1 starting date, but other options that use different thresholds and specific biofix dates are available on the Degree-Day Calculator. The Degree-Day Calculator is available as a result of a joint effort of current and former extension entomologists (primarily Kelly Cook) and Bob Scott of the Illinois State Water Survey. If you have questions about how to use the site, contact me or Bob Scott ([rwscott1@uiuc.edu](mailto:rwscott1@uiuc.edu)).

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Degree-days, base 50 F, January 1 through August 23, 2007 (left), and projected through August 30 (center) and September 6 (right).

**Degree-day accumulations, base 50 degrees F, starting January 1.**

Station	County	Base 50F DD Jan 1 – Aug 23, Historic Average	Base 50F DD Jan 1 – Aug 23, 2007	Base 50F DD Jan 1 – Aug 30 (Projected)	Base 50F DD Jan 1 – Sep 6 (Projected)
1. Freeport	Stephenson	2255	2362	2512	2649
2. Dekalb	Dekalb	2289	2266	2408	2536
3. St. Charles	Kane	2188	2371	2514	2644
4. Monmouth	Warren	2443	2722	2879	3024
5. Peoria	Peoria	2559	2752	2918	3071
6. Stelle	Ford	2409	2356	2513	2659
7. Kilbourne	Mason	2670	2897	3065	3218
8. Bondville	Champaign	2554	2634	2790	2937
9. Champaign	Champaign	2644	Missing	Missing	Missing
10. Perry	Pike	2603	3198	3370	3528
11. Springfield	Sangamon	2792	2994	3173	3342
12. Brownstown	Fayette	2900	3074	3254	3426
14. Belleville	St. Claire	2966	3427	3606	3775
15. Rend Lake	Jefferson	3081	3537	3724	3903
16. Fairfield	Wayne	3027	3590	3774	3950
17. Carbondale	Jackson	2979	3339	3519	3689
18. Dixon Springs	Pope	3043	3501	3684	3861

**Notes from Chris Doll**

It's now only four more weeks until fall by the astronomical charts. For those of us in hot and dry southern and southwestern Illinois, it cannot come to soon, providing there will be some precipitation with it. For the record, my gauge had 0.4 inches for July and now shows 0.2 inches for August. That includes the eight grass-wetters since the 17th. The heat (4 days over 100 degrees and 21 days over 90 degrees) this month, coupled with the lack of rainfall has taken its toll on most non-irrigated crops, field as well as orchard. Apples don't have much color, except for buckskin and sunburn, and this is sometimes coupled with watercore and corking. The "Apple-Crop" discussions lately have been about problems with watercore, and it has been prevalent in many of the light crops of early varieties in the Back-40. In a couple of commercial orchards, Jonathans are dropping and some also show watercore. Of course, the peach crop is past, and it takes lots of water to keep fall red raspberries from drying up.

Mid-August is the usual time for nitrogen applications to matted-row strawberries. If it can be applied and watered in, this is the time. The rate depends on pre-plant or post harvest applications, but the usual suggested rate is 40-50 pounds of N per acre. One of the givens for this crop is that fall rains will allow germination of fall weeds, and so look at the herbicide charts and work accordingly.

Mid-August to Mid-September is usually the ideal time to prepare and sow cover crops in fruit plantings. It's a tough go right now, but hopefully the job can be done in the next month. And I like to see a nurse crop of oats to give some rapid cover to prevent erosion.

The Jonathan apple crop and other varieties that tend to drop will need special attention this year. In the orchards visited this week, the number of fruits on the ground, coupled with the number of fruits that come off with a light limb tapping, means that more will be lost if NAA is not used pretty quickly. It appears that a choice of saving the crop for earlier picking versus maybe inducing a little earlier maturity must be made. At this writing, temperatures are in the mid- to upper 90's and not good for using NAA, but it could be applied as soon as it cools off 10 degrees.

I look at August as a month for tip-laying black raspberries and thornless blackberries if more plants are needed. Both species are trying to do it naturally by sending the growing tips toward the soil, and with available soil moisture, it will happen. Placing the tip in a crevice made with a spade or shovel will help the process along. Budding of tree fruits is another propagation practice that can still be done (although near the end of the season). Most likely, the bark will not be slipping for T-budding in stock plants because of the drought, but chip budding can be done.

It has been a dry growing season in this area, but fire blight was a problem for many growers with apples and pears this spring. As part of the "unusual" year, I've seen fire blight infections from mid-July in some apples in the Back-40 and in a pear tree that I'm caring for at a historical home in Edwardsville. There also has been some blackrot, bitterrot and white rot in apple orchards in the area.

*Chris Doll*

### ***Recommended Storage Temperatures and Humidities for Fruits and Vegetables***

Temperature and humidity are the most important factors when it comes to storing fruits and vegetables. For many fruits and vegetables, the best storage temperature is as close as possible to the freezing point (two to three degrees above freezing) without freezing the tissue. The reason is that tissues burn less reserve energy through respiration when stored at close to freezing. For example, most apples varieties freeze at about 28 °F and so the best temperature to store apples such as Red and Golden Delicious, Gala, Fuji, Braeburn, and Jonathans is at 30 °F. However, the skin and flesh of some varieties of apples and some vegetables cannot tolerate low temperature. They develop pitting and brown discoloration of the skin and internal breakdown of the tissue when stored at 30 °F. Varieties that do not tolerate low temperature are called chilling-sensitive varieties. These include most summer apples, McIntosh, and Honeycrisp.



Honeycrisp apples stored at 30 °F for about 3 months showing internal breakdown due to low storage temperature.

The best storage temperature to store chilling-sensitive varieties is at about 36 to 40 °F. With the exception of Honeycrisp apples, most chilling-sensitive varieties do not store very well. Another way to reduce chilling injury in Honeycrisp and other chilling-sensitive fruits and vegetables is by conditioning them at an intermediate temperature (about 60 to 65 °F) for 6 to 10 hours, depending

on how hot the weather is. If it is very hot (90 °F or above), then keep them at the intermediate temperature for longer time ( 8 to 10 hours).

Other chilling-sensitive fruits and vegetables include: most squash varieties, sweet and chipping potatoes, cucumbers, melons, okra, and green tomatoes. This group should be stored at 56 °F. Eggplant, zucchini or marrow, honeydew, winter melons, yellow and red potato, button squash, beans, and ripe tomato should be stored at about 45 °F.

Fruits and vegetables that can be stored at close to 30 °F include sweet corn, all cole crops (such as cabbage, broccoli, cauliflower, and radishes), peas, lettuce, carrots, shelled green beans, celery, beet roots, asparagus, artichoke, turnip, green and dry onions, peaches, cherries (tart and sweet), most brambles, strawberries, and pears.

Relative humidity should be maintained at close to 95% for all fruits and vegetables with exception of dry onion and garlic, and ginger where it should be kept at 65 to 70%. To increase relative humidity in a walk-in cooler use cold humidifiers or sonicating humidifiers, but don't use steam humidifiers.

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## ***Fruit Production and Pest Management***

### ***Codling Moth Phenology***

Developmental events for the codling moth based on degree-day accumulations are presented below. Remember that **“biofix”** refers to the date of the first sustained capture of first-generation moths in traps.

Codling moth development:

First moths of third generation emerge	~1920 DD <sub>50</sub> after biofix
99 percent of second generation eggs hatched	~2100 DD <sub>50</sub> after biofix
Beginning of third generation egg hatch	~2160 DD <sub>50</sub> after biofix
*First moths of fourth generation emerge	~2900-3000 DD <sub>50</sub> after biofix
*Beginning of fourth generation egg hatch	~3200 DD <sub>50</sub> after biofix

(Table based on ***Orchard Pest Management*** by Beers et al., published by Good Fruit Grower, Yakima, WA.)

\* Extrapolated from the model presented by Beers et al.

*Degree-day updates and codling moth comments from south to north, for select locations in Illinois:*

See previous issues of this newsletter for the names of specific orchards where biofix dates were observed and reported. All degree-day accumulations and predictions are based on nearest weather station data; temperatures recorded within your orchard provide more accurate data; use the numbers from the table below as approximations only.

For codling moth:

<b>Orchard Location</b>	<b>Weather Station</b>	<b>CM Biofix Date</b>	<b>DD<sub>50</sub> Aug 22, 2007</b>	<b>DD<sub>50</sub> projected Aug 29, 2007</b>	<b>DD<sub>50</sub> projected Sep 5, 2007</b>
Murphysboro	Carbondale	18 April	3048	3227	3390
Belleville	Belleville	23 April	3163	3341	3503
Edwardsville	Belleville	29 April	3073	3250	3412
Brussels	Brownstown	27 April	2770	2950	3116
Urbana	Champaign	30 April	Missing	Missing	Missing
Speer	Peoria	07 May	2373	2537	2684
Harvard	Freeport	10 May	2092	2240	2370

These degree-day totals since biofix are 400 to 500 greater than historical averages for the same time periods for Carbondale and Belleville, about 200 degree-days greater than average for the same time period for Brownstown, and about 120 and 170 greater than average for the same time periods for Peoria and Freeport, respectively. This means that yes, depending on location, the likelihood of third or fourth generation flights and egg-laying is greater than it has been in most years. At this time some mature larvae will enter diapause (“programmed dormancy”) and spin a hibernaculum for overwintering, but with high temps and advanced development, some will pupate, emerge as moths, and lay eggs. These eggs will hatch and enter fruit. So ... if your codling moth traps – or oriental

fruit moth traps – are capturing more than 3 to 5 moths per trap per week, continuing to protect late apples is necessary. PHIs for insecticides and miticides are listed on pages 37-38 of the [2007 Midwest Commercial Tree Fruit Spray Guide](#).

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## ***Vegetable Production and Pest Management***

### ***Corn Earworm Moth Flights:***

Over the last 7 to 10 days, corn earworm moth counts have remained moderate to very high in many locations in Illinois. At Collinsville, Dan Fournie's trap caught 269 moths overnight on August 18-19; at Urbana, our trap caught 210 moths overnight on August 20-21; and as far north as Burlington, the catch overnight on August 18-19 was 112 moths. As long as moth flights of this magnitude continue, fresh-market sweet corn growers whose markets demand worm-free corn need to use a 3-day spray interval with an effective pyrethroid such as Capture, Warrior, Mustang Max, or Baythroid. Bt sweet corns have been protected effectively by using a 4- or 5-day spray interval. A key step is to get the first spray on within 2 days after first silking occurs if moths are being caught in pheromone traps. If growers are concerned about the effectiveness of pyrethroids, tank-mixing Larvin, Lannate, or Sevin (all carbamates) with one of the pyrethroids above is an option. Entrust applied at 2- to 3-day intervals will provide fair to good control for organic growers.

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### ***Aphids and Whiteflies in Late-Season Vegetables***

A repeat of my usual fall reminder on these insects ...

Beginning in mid August and continuing through final harvests in late September and October is the time of year that aphids show up as late season “colonizers” or “passers through” in several vegetable crops, including tomatoes, peppers, cucurbits, and snap beans. In peppers and tomatoes, the culprits usually are green peach aphid and potato aphid. In pumpkins, cucumbers, melons, and squash, the pest species that colonizes plants is generally the cotton-melon aphid.

Understanding the seasonal biology of aphids helps in understanding the nature of species that simply “pass through” vegetable crops. Most aphids that winter successfully in Illinois have separate winter and summer hosts. Eggs overwinter on a woody plant, and the aphids that hatch from those eggs usually cycle through a few generations on that woody host in the spring and early summer. When “the time is right,” a generation of winged adults is formed, and these “alates” (aphids with wings) migrate to a summer host, usually an annual plant. Rosy apple aphid winters as eggs on apple trees and related species, then moves to narrow-leaf plantain in the summer; soybean aphid winters on buckthorn, then moves to soybeans in the summer. As the summer ends and annual plants begin to dry down, winged adults fly back to their winter host to lay eggs. This life cycle pattern results in lots of aphids moving from place to place in the spring and early summer and again (in even greater numbers) in the late summer and fall. (Not all aphids that are pests of Illinois crops winter here; some are carried here on high-level winds from the south ... the corn leaf aphid is one common example of a pest species that reaches us in this way.)

So aphids can be a problem in vegetables when they actually colonize plants (settling on the plants, reproducing, and building up numbers) or when they simply pass through weedy areas and then fields, making feeding probes along the way, picking up and transmitting viruses as they do so. In peppers and cucurbits, virus transmission by several aphid species may threaten yields and crop quality when the aphid vectors pass through and feed in the crop earlier in the season, but virus transmission in these situations is NOT really preventable by insecticide applications. However, when colonies of aphids build on plants in late summer, controlling them to prevent yield losses that result directly from feeding can be worth doing.

In cucurbits, Thiodan (endosulfan) and Capture give some control, but thorough coverage of upper and lower leaf surfaces is essential (as it is for all insecticides used for aphid control except for systemic products). Dimethoate is labeled for use on melons for aphid (and mite) control, but its use on other cucurbits is not legal. Malathion, Diazinon, and Lannate are somewhat effective. Newer insecticides labeled for aphid control in cucurbits include Fulfill (pymetrozine) and Actara (thiamethoxam). In peppers and tomatoes, Assail, Danitol (tomatoes only), Orthene (peppers only), Dimethoate, Thiodan, and Provado are labeled for aphid control; all are fairly to very effective. Platinum and Fulfill are newer products registered for aphid control in peppers. In addition, an older organophosphate, Metasystox-R (now sold as MSR Spray Concentrate by Gowan), is still labeled and effective for aphid (and mite)

control on peppers and cucurbits. For organic growers, insecticidal soaps such as M-Pede are the best bet, though thorough coverage of leaves is especially important for soaps.



*Left: green peach aphid colony (photo from Colorado State University). Right: greenhouse whiteflies.*

Whiteflies don't winter well in the Midwest, but by late season the combined processes of migration, import on transplants, and local population increases produce populations great enough to warrant control in several vegetable crops, especially in the southern part of the state. In recent years, the "players" have included a banded-winged species, the greenhouse whitefly, and the sweet potato or silverleaf whitefly. The crops most often infested are green beans, cucurbits, eggplant, peppers, and tomatoes. The effectiveness of insecticides labeled for whitefly control varies considerably among locations, depending on the insecticide resistance characteristics of local populations. In some instances, a pyrethroid (Warrior, Baythroid, Mustang-Max, Capture, Asana, or others, depending on the specific crop) may be effective; in other instances the local population may be resistant and go uncontrolled. Provado and Assail are effective alternatives in some of these crops, as are Lannate, Dimethoate, and Thiodan. Actara, Knack, and Fulfill are labeled for whitefly control in peppers; Fulfill is labeled for use on cucurbits as well. Insecticidal soaps (M-Pede) and neem products provide some control for organic growers. The key is to scout at least weekly to detect building infestations and to evaluate any insecticide treatments a couple of days after application. If a particular product fails to provide control, shift to an unrelated insecticide if another treatment is necessary. Check the [2007 Midwest Vegetable Production Guide](#) for listings of registered products for specific crops and for preharvest intervals (PHIs) that must elapse between application and legal harvest for each crop and insecticide combination.

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### ***Less seriously ...***

I was driving to work Monday morning, not paying enough attention. The light changed and car in front of my stopped on a dime ... I didn't. Wham ... rear-ended him. My fault ... I felt terrible.

He got out of his car, and he was fuming, almost uncontrollably. He was also a dwarf.

He muttered several swear words as he stomped back toward my car, then shook his fist at me and gained enough control of his anger to exclaim simply, "I am NOT happy."

I should have resisted but I couldn't. I asked him, "Then which one are you?"

Probably will not mention that on the accident report.

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