THE UNIVERSITY OF MAINE
Cooperative Extension
Pest Management Unit

Monday, March 1, 2021 Vol 28:2

Upcoming Webinars

Maine Preseason Tree Fruit Webinars

Wednesdays, 12 - 1:30pm, March 3, 10, 17: 2021

Webinars are free. All are welcome. **Preregistration is required.**
https://ag.umass.edu/fruit/news-events/new-england-winter-fruit-seminar-series
Pesticide applicator recertification credits will be available to growers licensed in CT, MA, ME, NH, RI, or VT.

#1 Wednesday, March 3, 2021, 12pm-1:45pm Zoom link: User unique Zoom link is sent when you pre-register.		
Introduction		12:00 PM
Dr. Suzanne Blatt Kentville (Nova Scotia) Research and Development. Agriculture & Agri-Food CAN Q&A	***Managing a Trickster: Adventures in Apple Maggot Control***	12:05 PM 1:00 PM
Earl Bunting Doles' Orchard, President Maine State Pomological Society.	***Maine State Pomological Society Annual Meeting***	1:15 PM
Adjourn		1:45 PM

#2 Wednesday, March 10, 2021, 12pm-1:30pm Zoom link: User unique Zoom link is sent when you pre-register.		
Introduction		12:00 PM
Dr. Jaime Pinero University of Massachusetts Q&A	***Research update on early-season insect pests***	12:05 PM 1:00 PM
Chris Howard University of Maine Cooperative Extension	***Crop Insurance Update***	1:10 PM
Glen Koehler University of Maine Cooperative Extension	***Introducing the Maine Ag Weather Network***	1:20 PM
Adjourn		1:30 PM

#3 Wednesday, March 17, 2021, 12pm-1:30pm Zoom link: User unique Zoom link is sent when you pre-register.		
Introduction		12:00 PM
Dr. Renae Moran University of Maine Cooperative Extension and Maine Agricultural Experiment Station. Q&A	***Honeycrisp Bitter Pit and Soft scald management.***	12:05 PM 12:35 PM
Glen Koehler University of Maine Cooperative Extension Q&A	***Back in the Saddle - AgRadar for 2021.***	12:50 PM 1:20 PM
Adjourn		1:30 PM

Upcoming Maine Organic Farmer and Gardener Association workshops:

For more information and to register for these, go to
https://www.mofga.org/trainings/orcharding/

March 13 – Pruning Fruit Trees. Saturday, 10 a.m. - 12 p.m. Unity, Pownal, Lubec & Blue Hill. $35; $25 for MOFGA members. Learn to prune fruit trees.

March 21 – Bringing Back an Old Orchard. Sunday, 10 a.m. - 12 p.m. Dixmont & Deer Isle. $35; $25 for MOFGA members. Learn to prune old apple trees that haven't been pruned in many years.

March 27 – Pruning Fruit Trees. Saturday, 10 a.m. - 12 p.m. Patten, Maine. $35; $25 for MOFGA members.

March 28 – Seed & Seed-Saving Workshops. Sunday, 2-5 p.m. Online. Free. Webinars start on the hour, every hour.

March 28 – Online Seed Swap. Sunday, 7 p.m. Online. Free

April 4 – Scionwood & Fruit Tree Workshops. Sunday, 2 - 6 p.m. Online. Free. Webinars start on the hour, every hour.

April 10 – Grafting Fruit Trees. Saturday 10:00 am - 12:00 pm. $30; $20 for MOFGA members.

Webinar recordings

Dealing with Stone Fruit Bacterial Disease Problems
Disease discussion starts at 26 minutes into video
Speakers: Dr. Kari Peter, Penn State, with NH grower panel: Giff Burnap, Carl Hills, Kitt Plummer and facilitator Jeremy Delisle. Disease discussion last about 1.75 hours.
https://media.unh.edu/media/1_dn9pr3o8

Fire Blight Management for Apples and Pears
Speaker: Dr. George Sundin, Michigan State University.
Topics: New research to improve fire blight management, including fire blight life cycle and activity, blossom blight prevention, and incorporating plant growth regulators and streptomycin-alternative controls. Length: 1 hour. (notes about Sundin's work shown in next section below) https://www.youtube.com/watch?v=MOSdGtd0R0w&feature=emb_logo

Crop-Adapted Spraying: How to Save Time, Money, Pesticide & Water
Speaker: Jason Deveau, OMAFRA 27 minutes
https://www.youtube.com/watch?v=exZmZU86560&feature=emb_logo

Training and Pruning Strategies to Keep Peach Trees Healthy and Productive,
Speaker: Bill Shane, Michigan State University: https://youtu.be/te3EfCR4x6g

Additional webinar recordings hosted by Ontario Fruit & Vegetable Convention and Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) are online at
https://www.ofvc.ca/videos.html

Maine Board of Pesticides Control Credit Calendar

A full list of recertification trainings is online at
https://www.maine.gov/dacf/php/pesticides/credit_calendar.shtml

Fire Blight research update

New Light on the Fight Against Fire Blight

By Thomas Skernivitz in Growing Produce, February 16, 2021.
https://www.growingproduce.com/fruits/new-light-on-the-fight-against-fire-blight/?e=glen.koehler@maine.edu&utm_source=omail&utm_medium=newsletter&utm_campaign=afgenews02172021

The excepts below from this article highlight many of the points made by Dr. George Sundin in the fire blight webinar link shown in the previous section:

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A second 2020 study involving Kasumin targeted the most effective timing of its spray application. MSU experimented on 'Fuji' during a predicted rating of 145 on the epiphytic infection potential (EIP) risk index — "pretty high for May 24," Sundin says.

"The fire blight pathogen predominantly grows at night on bloom. So, we're thinking, 'Should we be applying antibiotics in the evening to take advantage and attack the pathogen before overnight growth occurs?'" Sundin says. "Also, (there was) the thinking that we'd get the best activity from Kasumin with more time out of the sun if we're putting it on the evening before a predicted 145 EIP."

On the 'Fuji' trees sprayed with water, the result was 55% blossom blight — "a really high level," Sundin says.

On the trees sprayed the evening before with Kasumin or streptomycin, the rates of blossom blight were 15% to 20%, respectively — "not significantly different" and "pretty good control," Sundin says. Expecting diminished control after waiting until the next morning to spray, the results were nonetheless similar to the evening before.

Where the experiment turned was with sprays that occurred on the evening of the 145 EIP day. Streptomycin, because it is partially systemic, remained at around 15%. But with Kasumin, the rate of blossom blight rose to around 35%.

"Streptomycin will go into the flower even if the pathogen has already gone into the flower. It can go in there and still knock back disease," Sundin says. "But Kasumin cannot. Kasumin does not have any post-infection capability."

The results illustrate that, if Kasumin is applied too late on a high EIP day, then growers will lose control because the infection has already occurred.

"The best times of applying Kasumin are the evening before that day or morning of that day," Sundin says. "If you wait too long, and you're going on the afternoon or evening of that high EIP day, it's going to be too late to get the excellent control that we normally get with Kasumin."

APOGEE/ACTIGARD COMBINATION

In the process of "trying to reach the top wire relatively quickly," young high-density trees are highly susceptible to fire blight, Sundin says. Apogee (prohexadione calcium, BASF) helps to control the disease, but it also does its job as a plant growth regulator (PGR).

On one hand, "nobody wants to use Apogee to shut down that growth for fire blight control," Sundin says. On the other hand, no grower wants to gamble with such a potentially decimating disease. "Solutions are needed for shoot blight that do not put a huge constraint on growth," he says.

Sundin and his team have been researching lower rates of Apogee in combination with Actigard, a plant stimulator (acibenzolar-S-methyl, Syngenta) that induces resistance in the host.

"We're trying to see if we can either prevent shoot blight strikes from occurring or at least slow them down, such that we can catch them and prune them out before the bacterium reaches the central leader of the tree," Sundin says. "What we've found over the last several years is that it is a combination of both of these materials that provides the control. If we use the same rates of either one alone, we don't get the control that we get with the combination."

Separate studies in 2018 and 2019 exemplified this. The latter trial was repeated in 2020, resulting in a similar conclusion (despite uneven infection rates last year): The best treatment is a per-acre mix of 2 ounces Apogee and 1 ounce Actigard, which, in 2019, resulted in a 4.5% shoot blight infection rate compared to the control of percentage of 18.8.

Sundin recommends starting at king bloom petal fall and applying weekly for three to four weeks depending on rainfall totals. "If it's very dry, you probably don't have to put on the last application or maybe the last two," he says. "If we're getting a lot of rain, though, I think you should increase the rate of Apogee an ounce or two because Apogee works a little bit less the more rainfall we're getting."

Until further notice, this combination of 2 oz Apogee/1 oz Actigard is the "best option for shoot blight control in high-density plantings," Sundin says.

"I really hope we're getting more adoption of this usage. It's going to knock back shoot blight, and it won't inhibit your growth to the extent that you're worried about it. But the other thing is it will control fire blight, and that can prevent epidemics that could cause you to lose a lot of trees from these vigorously growing early-stage high-density plantings."
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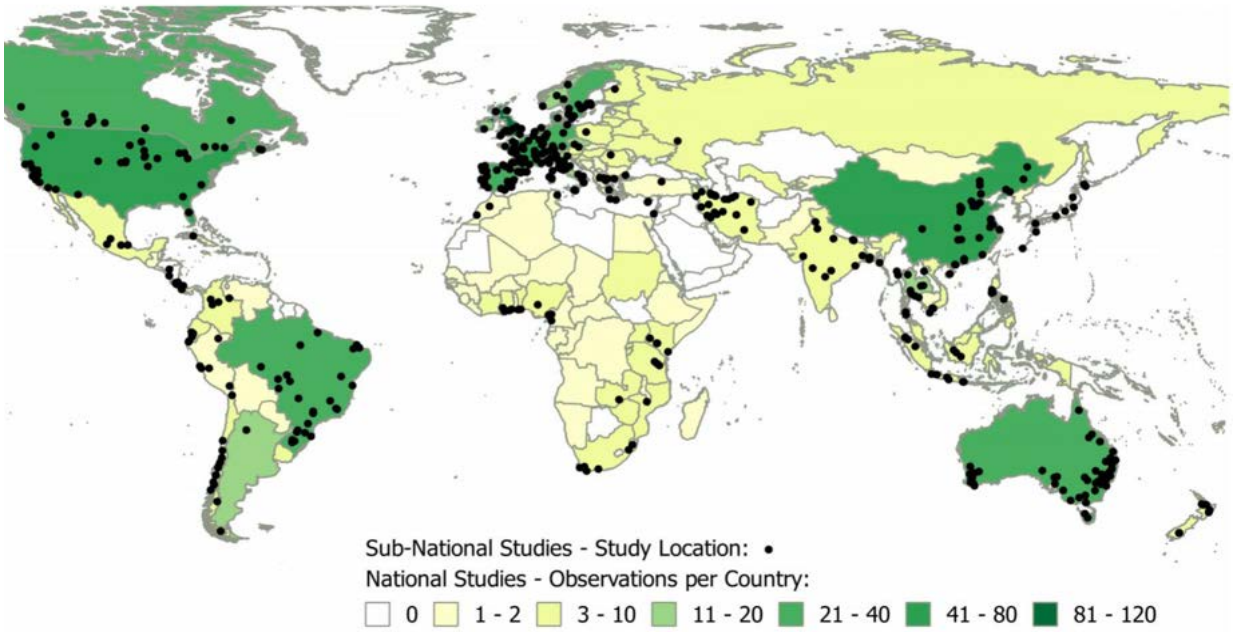
Dr. Kari Peters at Penn State also reports good results using Actigard as a supplementary tool to suppress fire blight.

Environmental Impact of Different Foods

Source: Reducing food's environmental impacts through producers and consumers
J. Poore and T. Nemecek. 2018. Science 360(6392): 987-992.
DOI: 10.1126/science.aaq0216. https://science.sciencemag.org/content/360/6392/987

The authors screened 1,530 studies published between 2000 and June 2016. Observations are approximately centered on the year 2010. Of the studies they reviewed, 570 met their criteria. This resulted in 2278 unique observations, covering ~38,700 regional or farm level inventories in 119 countries. Most of the data came from studies covering Europe, North America, Australia, Brazil, and China. Locations from which data were used are shown in the figure below.



The estimates for environmental impacts from food production were based on a comprehensive life cycle analysis. For apples and other orchard crops that includes emissions during nursery production prior to orchard planting and during the years prior to full orchard maturity.

Five categories of environmental impact were rated for each food: Greenhouse gas emissions (GHG), Land use, Terrestrial acidification, Aquatic eutrophication, and Freshwater withdrawal. The number of studies used to generate the impact rating for apples were: GHG, Land use, Freshwater withdrawals – 66; Terrestrial – 55, and Aquatic – 51.

The number of farms or regions represented in the apple data were: For GHG, Land use, Freshwater withdrawals – 128; for Terrestrial – 92, for Aquatic – 88.

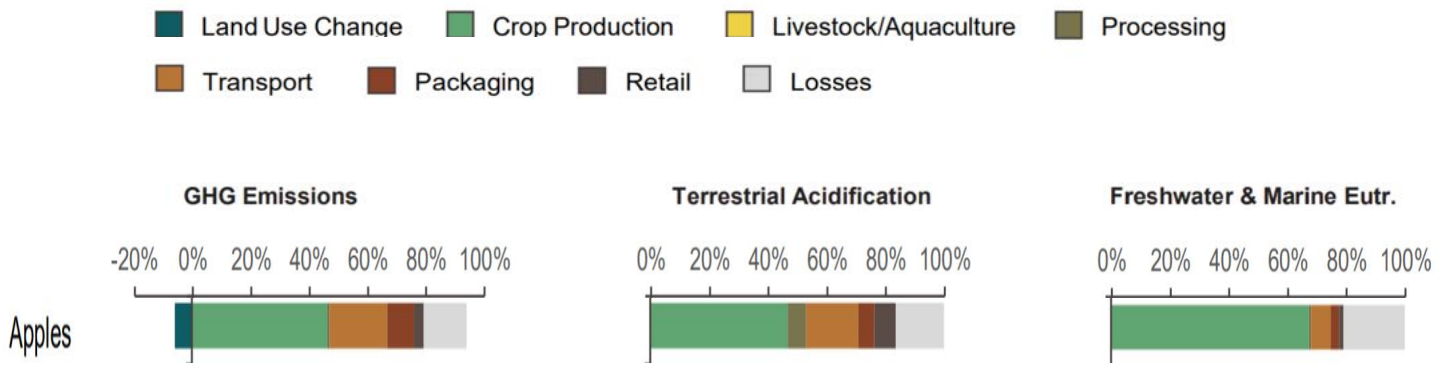
The environmental impacts for each food were adjusted by yield per unit of land area to derive an impact value per nutritional unit. For vegetables and fruits, the nutritional unit was defined as 1 kilogram (2.2 pounds). Average apple yield was based on 66 observations for calculations was the equivalent of 518 bushels per acre (@ 42 lbs. per bushel). The average yield does not include trees in residential areas or very small orchards. The impact rating for freshwater withdrawals were adjusted for local freshwater scarcity. The supplement to the article is much longer than the article itself and covers the many details of how ratings were generated.

Table 1. Food commodities ranked by their average percentage of the maximum environmental impact within each of five categories:

Food Commodity	Relative Nutritional Unit (NU) for weighting impacts	Average % of maximum across each of the 5 categories	Greenhouse gas emissions (kg CO2 eq./ NU)	Land use (m^2 /NU)	Terrestrial acidification (g SO2 eq./NU)	Aquatic eutrophication (g PO4 eq./NU)	Freshwater withdrawal (1000 gals per NU) relative to local water scarcity
Average of 42 rated foods	na	**10.2%**	**3.5**	**10**	**24**	**22**	**6.2**
Median of 42 rated foods	na	**4.0%**	**1.4**	**2.2**	**8.6**	**5.4**	**2.8**
Beef (beef herd)	0.50 kg fat-free, bone-free meat. 100 grams protein.	**74%**	50	164	160	151	4.6
Beef (dairy herd)	0.50 kg fat-free, bone-free meat. 100 grams protein.	**56%**	17	22	174	185	16
Lamb & Mutton	0.50 kg fat-free, bone-free meat. 100 grams protein.	**49%**	20	185	69	49	19
Shrimp & other crustaceans (farmed)	0.67 kg edible. 100 grams protein.	**44%**	18	2.0	90	154	23
Pork (pig meat)	0.63 kg fat-free, bone-free meat. 100 grams protein.	**24%**	7.6	11	88	47	11
Fish (farmed)	0.44 kg edible fish. 100 grams protein.	**19%**	6.0	3.7	29	103	4.8
Poultry meat	0.59 kg fat-free, bone-free meat. 100 grams protein.	**14%**	5.7	7.1	59	28	2.2
Eggs	0.91 kg. 100 grams protein.	**12%**	4.2	5.7	48	20	4.3
Cheese	0.46 kg. 100 grams protein.	**31%**	11	40	75	45	22
Cow Milk (pasteurized, 4% fat)	1 liter. 100 grams protein.	**7.9%**	3.2	9.0	20	11	5.2
Soymilk 1%	1 liter. 100 grams protein.	**1.0%**	1.0	0.7	2.6	1.1	0.3
Tree Nuts (almonds, Brazil nuts, cashews, pecans, walnuts etc.)	0.63 kg shell-free dried nuts. 100 grams protein.	**21%**	0.3	7.9	28	12	37
Peanuts & other groundnuts	0.39 kg shell-free dried nuts. 100 grams protein.	**5.1%**	1.2	3.5	8.6	5.4	6.2
Dry Beans (chickpeas, dry beans, fava beans, lentils, etc.)	0.48 kg dried without pod. 100 grams protein.	**4.4%**	0.8	7.3	10	8.0	2.8
Peas	0.45 kg. 100 grams protein.	**2.8%**	0.4	3.4	3.8	3.4	3.3
Tofu (soybean curd)	0.63 kg. 100 grams protein.	**2.3%**	2.0	2.2	4.2	3.9	0.8
Rice (flooded)	0.27 kg full grain. 1000 kcal.	**4.0%**	1.2	0.8	7.4	9.5	3.6
Wheat & Rye (bread)	0.37 kg. 1000 kcal.	**2.7%**	0.6	1.4	5.0	2.7	3.3
Oatmeal 2%	0.39 kg. 1000 kcal.	**2.4%**	1.0	2.9	4.1	4.3	1.9
Potatoes	1.43 kg, 1000 kcal.	**1.9%**	0.6	1.2	5.3	4.8	1.0
Corn (cornmeal)	0.22 kg. 1000 kcal.	**0.9%**	0.4	0.7	2.6	0.9	0.6
Cassava	1 kg. 1000 kcal.	**1.2%**	1.4	1.9	3.5	0.7	0.0

Tomatoes	1 kg	**4.3%**	2.1	0.8	17	7.5	1.4
Brassicas (broccoli, Brussel sprouts, cabbage, cauliflower, kale, etc.)	1 kg	**2.7%**	0.5	0.6	8.2	5.0	2.2
Other Vegetables (cucumber, green beans, green peas, lettuce, etc.)	1 kg	**1.8%**	0.5	0.4	6.4	2.3	1.3
Onions & Leeks	1 kg	**1.1%**	0.5	0.4	3.6	3.2	0.3
Root Vegetables (beets, carrots, onions, rutabagas, sweet potato, turnips, etc.)	1 kg	**0.8%**	0.4	0.3	2.9	1.6	0.3
Berries and Grapes	1 lg	**5.3%**	1.5	2.4	12	6.1	5.6
Apples	1 kg	**2.3%**	0.4	0.6	3.5	1.5	3.4
Bananas	1 kg	**1.7%**	0.9	1.9	6.4	3.3	0.2
Citrus fruit	1 kg	**1.5%**	0.4	0.9	4.0	2.2	1.2
Olive oil	1.0 liter refined oil	**33%**	5.4	26	38	37	47
Sunflower oil	1.0 liter refined oil	**16%**	3.6	18	28	51	9.6
Canola oil (rapeseed)	1.0 liter refined oil	**9.2%**	3.8	11	29	19	2.8
Soybean oil	1.0 liter refined oil	**8.4%**	6.3	11	16	12	3.9
Palm oil	1.0 liter refined oil	**6.4%**	7.3	2.4	18	11	0.0
Cane sugar	1 kg	**7.3%**	3.2	2.0	18	17	4.3
Beet sugar	1 kg	**4.0%**	1.8	1.8	13	5.4	2.5
Dark Chocolate	50 grams	**2.1%**	2.3	3.5	2.3	4.4	0.0
Coffee	1 cup from 15 grams roasted, ground beans	**0.5%**	0.4	0.3	1.3	1.7	0.0
Beer (5% alcohol, barley)	200 ml	**0.3%**	0.2	0.2	1.3	0.5	0.0
Wine (12.5% alcohol)	80 ml	**0.2%**	0.1	0.1	1.0	0.4	0.0

Each food was also rated for the proportion of its environmental impact through eight stages of the food system supply chain.



For apples, Crop Production was the primary impact phase, followed by Transportation.

The "Land Use Change" phase included above and below ground carbon sequestration amortized over 20 years from the time the land was converted to use for production of a food. Of the 52 foods evaluated, 6 had negative "Land Use Change" impact on Greenhouse gas emissions (Apples, Bananas, Citrus fruit, Nuts, Olive Oil, Wine). Those foods still contributed to emissions through other phases of the supply chain.

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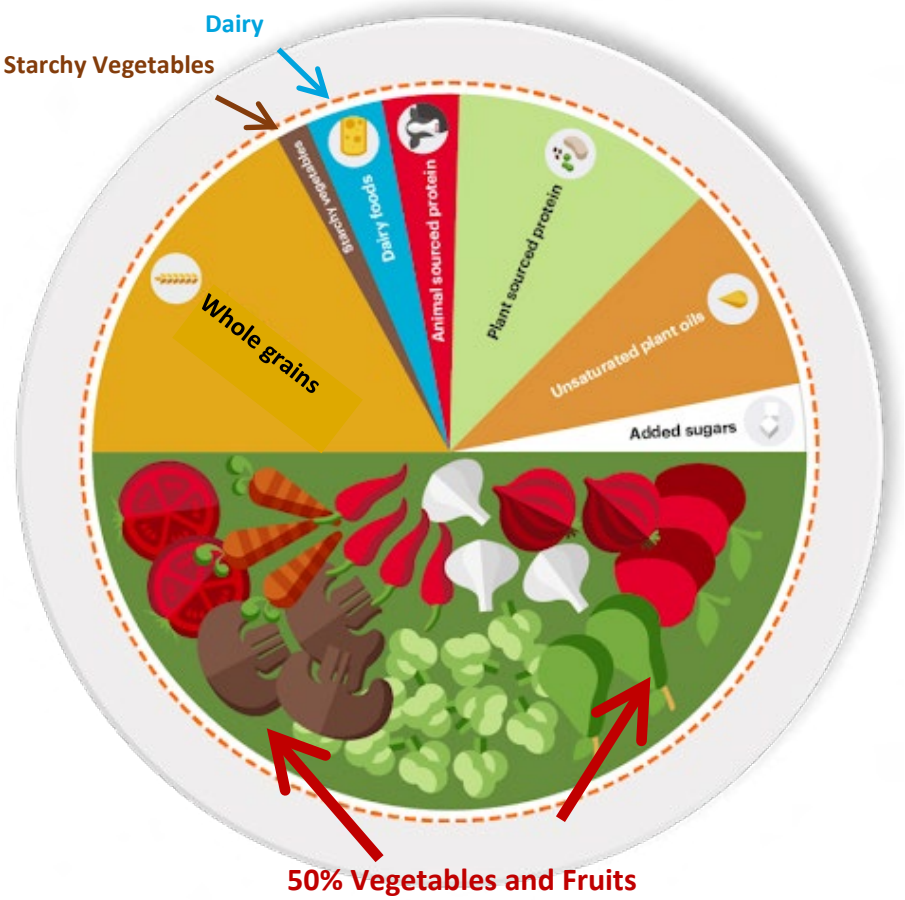
A 2016 study estimated that a global shift towards more plant-based diets that are in line with standard dietary guidelines could reduce global mortality by 6-10% by 2050 in addition to reducing greenhouse gas emissions by 29-70%, when compared to a business-as-usual scenario. The study defined a "planetary health diet" that is around half fruit and vegetables, with whole grains, unsaturated plant oils and plant-sourced proteins also playing a large role.

Source: Analysis and valuation of the health and climate change cobenefits of dietary change. M. Springmann, H.C. J. Godfray, M. Rayner, and P. Scarborough. 2016. Proceedings of the National Academy of Sciences. 113(15) 4146-4151. https://doi.org/10.1073/pnas.152311911



Closing Words

"Make your words sweet and tender … just in case you have to eat them later."
~ Anonymous

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