Toxic Plants and Their Friends

How to Keep You and Our Public Safe from Toxins June 6, 2023

Cindy Bruecks San Diego Master Gardener



University of CaliforniaAgriculture and Natural ResourcesUCCE Master Gardener Program

We Will Look At:

- Toxic plants per the Master Gardener Handbook
- What else is toxic in our foodchain environment?
- How can contamination affect our plants, our food prep and garden practices?



Brugmansias in San Francisco City Park







University of California

Agriculture and Natural Resources UCCE Master Gardener Program

Pretty Place for a Street-wise Bedroom- but

Toxic?





University of **California** Agriculture and Natural Resources

Agriculture and Natural Resources UCCE Master Gardener Program

Toxic Plants: Irritating to Deadly

The Text Chapter 20 and the UC ANR website together have 150+ entries of "non-safe" plants Differences between the two: The pdf gives multiple entries ("English Yew", "Yew, English") and Table 20.1 treats "selected poisonous plants")

Toxicity Levels:

- 1 Deadly: "Coma and death"
- 2 Less deadly but still bad: "vomiting and diarrhea"
- 3 Oxalates: sharp crystals can cause mechanical irritation
- 4 Dermatitis: makes you itch or worse, largely skin

reaction but may be very painful















University of California

Agriculture and Natural Resources UCCE Master Gardener P

A Note in Passing

- The text does not treat toxicity for animals.
 - You should be aware this is a critical concern for portions of our client population.
 - See UC ANR <u>https://ccah.vetmed.ucdavis</u>. edu/about/ucd-toxic-plant-garden
 - Also you can re-direct them to ASPCA, HSA or Wikipedia

<u>https://www.aspca.org/pet-care/animal-poison-control/toxic-and-non-toxic-plants?ms=MP_PMK_GGPoisonControl&initialms=MP_PMK_GGPoisonControl&gclid=CjwKCAjwgqejBhBAEiwAuWHioFAhhUYRB8zJ_h7CQSID9-p64m_D2hMOhK964ZJJVaRxvU_JxRHXIRoC_hwQAvD_BwE</u>

- https://www.humanesociety.org/resources/plants-and-food-can-bepoisonous-pets
- The text doesn't treat toxicity for bees/other beneficial insects either -We will address this in passing



Toxicity Level V

There's really a fifth level: UNKNOWN BUT ACCUMULATING Examples: heavy metals, pharmaceuticals, other chemicals

-"Small" amounts of toxic chemicals can enter the body via mouth/eyes/lungs/skin

-Many toxins are stored in adipose tissue (fat) where they remain until high stress (or an effective diet) can release them back into the bloodstream.

-Many affect the central nervous system or the liver.

THEY'RE ALL BAD FOR US



How Bad?

Some specified in Parts Per Million PPM or Parts per Billion PPB

-Not useful for homeowner's daily work

-Various USG agencies may set "safe" limits

-Many accumulate in tissues and move up the food chain

Best practice: avoid them altogether, minimize your exposure



Sources of Toxins in the Food Chain:

Primary: created by or within the plants

Introduced: -Mulch or fertilization with contaminated materials (horse manure, Nitrohumus) -Irrigation with contaminated water

Field or surface contamination (deer in the strawberries)

Animal or insect **product contaminated at feeding time** (Yellow Jessamine *(Gelsemium sempervirens)* - All parts contain a strychnine-like acting poison. And Honeybees which pollinate this plant can produce a toxic honey (also COW MILK poisonings)

Contamination during harvest (Gary Bender's Organic avocado example)

Contamination of foodstuffs after harvest and before marketing (bottled herbs, chocolate)

How clean is your USDA Organic food?



University of CaliforniaAgriculture and Natural ResourcesUCCE Master Gardener Program

And When You Come in the House:

Contaminated water used to wash, cook, sauce foodstuffs

Lead in water delivery system A LA Flint MI or San Diego Child Care Centers

Well water: have it checked periodically. Aquifers not managed, under attack

Post-harvest contamination by the consumer-

Have you mixed pesticides/insecticides in the kitchen sink?

Have you mixed contaminated tubs/trugs with harvest food?

Is any of your greywater collection done in the kitchen?

Speaking of greywater, what are you putting in your laundry tub?

And what drugs are you putting into yourself?



Field Contamination: Deer in the Strawberries

Escherichia coli O157:H7 infections associated with consumption of locally grown strawberries contaminated by deer.

Author information

Clinical Infectious Diseases : an Official Publication of the Infectious Diseases Society of America, 21 Jul 2013, 57(8):1129-1134 We identified 15 cases. Six cases were hospitalized, including 4 with hemolytic uremic syndrome (HUS). Two cases with HUS died. Illness was significantly associated with strawberry consumption from roadside stands or farmers' markets (matched odds ratio, 19.6; 95% confidence interval, $2.9-\infty$). A single farm was identified as the source of contaminated strawberries. Ten of 111 (9%) initial environmental samples from farm A were positive for E. coli O157:H7. All samples testing positive for E. coli O157:H7 contained deer feces, and 5 tested farm fields had \geq 1 sample positive with the outbreak PFGE pattern.



How About Pharmaceuticals? Per "Harvard Health"

Many samples show low levels of pharmaceuticals and other drugs in drinking water sources. We add to those when we use the drugs and excrete them. Very little broken down in the human body.

Water treatment plants do not routinely test for nor remove pharmaceuticals from the incoming waste water stream. Some do remove some, but those chemicals end up in the sludge and some of that is used for plant fertilizer, so we get it back in our plants grown with that fertilizer



Pharmaceuticals in the Environment

Drug use is rampant in the US The average older adult takes <u>prescription drugs</u>

Almost 90% of older adults regularly take at least 1 prescription drug, almost 80% regularly take at least 2 prescription drugs, and 36% regularly take at least 5 different prescription drugs. Per Merck Manual

<u>Recreational use/abuse</u> among young (and old) can be poorly estimated by the number of opioid overdose deaths (75,000 deaths in 2022 that were logged). In short, there is an ample supply of drugs taken and excreted by the US population And that's before you count <u>drugs for food animals</u>

and pets



A Moment for Parts per Billion (PPB)

Published limits on Some Heavy Metals from EPA and others:

Manganese 50 PPB

Lead 15 PPB (lead from pipes, or glaze on pottery)

Chromium (2 kinds) 100 PPB for all of them <u>cause cancer</u>. It affects the human liver and kidney and is known to cause circulatory disorders and nerve damage.

Copper 1.3 PB is good, excess can be bad

Nickel 100 PPB challenged. High levels carcinogenic, lower levels lead to irritation topically

Aluminum: above 200 PPB suspected links to dementia and Alzheimer's **Arsenic** levels above 10 PPB have been implicated



Pharmaceuticals in the Environment

"It's true that the levels [of the medications found in drinking water] are very low. But especially when it comes to pharmaceuticals that are synthetic hormones, there is concern, because hormones work at very low concentrations in the human body."

We know large amounts of pharmaceuticals are manufactured and sold nationwide, we know they are slow to breakdown and can endure through digestion, elimination and waste water processing. A very small amount can be considered dangerous. **They have been found in the tested water of 24 major metropolitan**

areas.



Secondary Poisoning of Babies from Contaminated Cow's Milk

From National Institutes of Health National Library of Medicine:

- Elimination of plant toxicants via milk by lactating animals is considered a minor route of excretion; however, it may be important when the health of the neonate or food safety in humans is considered. Among plant toxicants excreted in milk is tremetol or tremetone, the toxin in white snakeroot (Eupatorium rugosum) and rayless goldenrod (Haplopappus heterophyllus). These plants have been responsible for intoxication of cows and their suckling calves and for many human poisonings.
- Read: Babies poisoned by tainted milk from browsing cow



More on Contaminated Cow's Milk

- Ageratina altissima now Eupatorium rugosum, commonly called white snakeroot, is native to woodland areas in the Eastern United States. It is common throughout Missouri per Missouri Botanic Garden website.
- Sunset Western Garden Book says
 - ...grows in Zones 1-10, 14-17. ...'Chocolate' has especially deep color. Fluffy white flowers in late summer and early fall. Give rich soil, ample water."
 - Sunset does not mention it's toxicity.

Neither does our UC ANR pdf list of toxic plants (Ch 20 does):

https://ucanr.edu/sites/poisonous_safe_plants/files/154528.pdf

Haplopappus heterophyllus similarly missing from UC ANR list and Ch 20





Cortaderia selloana Pampas Grass -UC ANR lists as Level 1, but literature only describes as invasive, and tough to the touch -Weeds of the West is silent -Sunset WGB says it's invasive Ch 20 is silent



University of California Agriculture and Natural Resources

UCCE Master Gardener Program

Contamination During Harvest (Gary Bender's Organic avocado example)

Field pickers come with their 3-legged ladders and big shoulder bags They pick as fast as possible (with pay per piece, time is money) But to meet sizing standard, they need to cull sub-standard fruit from the bag or the entire bag is docked

So: dump the bag on the ground Pick out and toss sub-standard fruits Replace passable fruit in bag, submit for payment

But: in organic orchards, there's manure on the ground And now contaminated organic avocadoes



Contamination is a World-Wide Issue *per Sweden's Stockholm Resilience Center*

Beyond the widespread use of plastics, they cite concern over 350,000 synthetic chemicals, including pesticides, industrial compounds and antibiotics.

There has been a 50-fold increase in use of these chemicals since 1950, and the number is expected to triple again by 250.

DDT was banned for use in the US in 1972. It has a halflife of 98 years, 150 in an aquatic environment.



University of CaliforniaAgriculture and Natural ResourcesUCCE Master Gardener Program

ADVICE ABOUT EATING FISH

For Those Who Might Become or Are Pregnant or Breastfeeding and Children Ages 1 - 11 Years



Fisht provide key nutrients that support a child's brain development.

Fish are part of a healthy eating pattern and provide key nutrients during pregnancy, breastfeeding, and/or early childhood to support a child's brain development:

- · Omega-3 (called DHA and EPA) and omega-6 fats
- Iron
- lodine (during pregnancy)
- Choline

Choline also supports development of the baby's spinal cord. Fish provide iron and zinc to support children's immune systems. Fish are a source of other nutrients like protein, vitamin B12, vitamin D, and selenium too.

Choose a variety of fish that are lower in mercury.

While it is important to limit mercury in the diets of those who are pregnant or breastfeeding and children, many types of fish are both nutritious and lower in mercury.

This chart can help you choose which fish to eat, and how often to eat them, based on their mercury levels.





University of California

Agriculture and Natural Resources UCCE Master Gardener Program



Contamination of Foodstuffs After Harvest

Bottled Herbs and Spices: Hitting Close to Home

Chocolate: Foods from the Third World Bring Uncertainty



 University of California

 Agriculture and Natural Resources
 UCCE Master Gardener Program

Also in the CONCERN File:

- Consumer Reports December 2021 tested bottled herbs and spices
- Many samples of basil, ginger, cumin, <u>oregano</u>, paprika, <u>thyme</u> and turmeric had concerning levels of arsenic, cadmium and lead
- Black pepper, chili powder, coriander, curry powder, garlic powder, saffron, sesame seed and white pepper all tested clean



From CR With Permission

PICE TEST ESULTS	EERN	product. Dur findin be used to draw du products are organ the products are organ the products are il Regularly consumi of the concerning to children as a ret metals. Unless not more red boxes ne	gs are a afinitive of hized alpl sted acc ng % tea categorie sult of th ed, they ixt to a p	apot check of the marke, and co- sonclusions about brands. The habetically by type, Within each ording to the degree of concern spoon or more daily of a product se could, over time, pose a healt e combined levels of the three h could also pose a risk to adults. roduct, the higher the concern.	gro in h ri ea Th
BASIL		► BLACK PEPPER continued		► CORIANDER continued	
Simply Organic Basil		Penzeys Spices Tellicherry Black Pepper Fine Shaker Grind		Badia Ground Coriander (Culantro Molido)	E
365 Whole Foods Market		Great Value (Walmart) Ground Black Pepper		Great Value (Weimart) Organic Ground Coriander	C
o de un			-		
Sreat Value (Walmart) Basil Leaves		McCormick Pure Ground Black Pepper	~	Spice Islands Ground Coriander	2
Great Value (Walmart) Basil Leaves McCormick Culinary Ground Basil Albahaca Molida)		McCormick Pure Ground Black Pepper		Spice Islands Ground Coriander Morton & Bassett Ground Coriander	
Great Value (Walmart) Basil Leaves McCormick Culinary Ground Basil Albahaca Molida) Sausage Maker Ground Basil		McCormick Pure Ground Black Pepper CHILI POWDER		Spice Islands Ground Coriander Morton & Bassett Ground Coriander Laxmi Brand Corriander Powder	
Great Value (Wamart) Basil Leaves McCormick Culinary Ground Basil Albahaca Molida) Sausage Maker Ground Basil Litehouse Freeze Dried Basil	•	McCormick Pure Ground Black Pepper CHILL POWDER Morton & Bassett Chill Powder		Spice Islands Ground Corlander Morton 5 Bassett Ground Corlander Laxmi Brand Corriander Powder Penzeys Spices Corlander Ground	
Steat Value (Wemart) Basil Leaves AcCormick Culinary Ground Basil Albahaca Molida) Jausage Maker Ground Basil Itehouse Freeze Orled Basil Aorton & Bassett Basil*		McCormick Pure Ground Black Pepper CHILL POWDER Morton B Bassett Chill Powder Spice Islands Chill Powder		Spice Islands Ground Corlander Morton & Bassett Ground Corlander Laxmi Brand Corrlander Powder Penzeys Spices Corlander Bround	
Great Value (Weimart) Basil Leaves ACCornick Collinary Ground Basil Albahaca Molida) Ausaga Maker Ground Basil Atchouse Freeze Dried Basil Morton 9 Bassett Basil Spice Islands Sweet Basil		McCornick Pure Ground Black Pepper CHILI POWDER Morton & Bassett Chill Powder Spice Islands Chill Powder Simply Organic Chill Powder		Spice Islands Ground Corlander Morton & Bassett Ground Corlander Laxmi Brand Corrlander Powder Penzeys Spices Corlander Ground CUMIN	
ireat Value (Ivenan) Baell Leaves AcCornick Curinery Ground Baeil Albahaca Molida) ausaga Maker Ground Baeil Atchouse Freeze Dried Baeil Morton & Bassett Baeil Spice Talands Sweet Baeil BLACK PEPPER	-	McCornick Pure Bround Black Pepper CHILL POWDER Morton & Bassett Chill Powder Spice Islands Chill Powder Simply Grganic Chill Powder		spice Islands Ground Corlander Morton B Basett Bround Corlander Laxmi Brand Corrlander Pewder Penzeys Spices Corlander Ground CUMIN Spice Islands Ground Cumin Seed	
ireat Value (twinart) Banil Leaves AcCornick Culinary Ground Basil Mahana Molida Jausage Maker Ground Basil Litchouse Freeze Oried Basil Morten & Bassett Basil Black Bassett Basil BLACK PEPPER	•	McCornick Pure Bround Black Pepper CHILL POWDER Morton & Bassett Chill Powder Spice Islands Chill Powder Simply Organic Chill Powder Badla Polvo de Chill Powder Swad Chill Powder		Spice Islands Ground Corinder Morton B Besett Bround Corlander Laxmi Brand Corrlander Powder Penzeys Spices Corlander Ground CUMIN Spice Islands Ground Cumin Seed Simply Organic Ground Cumin	
ireat Value (twenard Banil Leaves deCornick Culinary Ground Basil Jakabaca Molida Jakabaca Molida Jakabaca Molida Jakabaca Molida Jakabaca Crista Jakabaca Crista Jakabaca Jak		McCornick Pure Bround Black Pepper CHILL POWDER Morton & Bassett Chill Powder Spice Islands Chill Powder Simply Organic Chill Powder Badia Polvo de Chill Powder Swad Chill Powder Good & Gather (Target)		Spice Islands Ground Corinder Morton 5 Besett Bround Corlander Laxmi Brand Corriander Powder Penzeys Spices Corlander Ground CUMIN Spice Islands Ground Cumin Seed Simply Organic Bround Cumin El Guapo Cumin (Comino)	
ireat Value (Ivenan) Baell Leaves deCornick Culinary Ground Baeil Jababaca Molida Jababaca Molida Jababaca Molida Jababaca Molida Jababaca Dried Baeil Jababa Peneze Dried Baeil BLACK PEPPER Rom's Bround Black Pepper El Guago Black Pepper El Guago Black Pepper Forund Stround Black Pepper		McCornick Pure Browne Black Pepper CHILL POWDER Morton B Bassett Chill Powder Spice Islands Chill Powder Simply Organic Chill Powder Badia Polvo de Chill Powder Swad Chill Powder Good 6 Sather (Ingest) Chill Powder		spice Islands Ground Corinder Morton B Basett Bround Corinader Laxmi Brand Corriander Powder Penzeys Spices Coriander Ground CUNIN Spice Islands Ground Cumin Seed Simply Organic Bround Cumin El Guapo Cumin (Comino) Motoren B Basett Ground Cumin Motoren Basett Ground Cumin	
Treat Value (Ivenard Baell Leaves AcCornick Culinary Ground Baeil Jabasea Molida Jabasea Molida Jabasea Molida Jabasea Corne Basett BitACK PEPPER BitACK PEPPER Tom'n Ground Black Pepper El Guapo Black Pepper Plementa Nagra Molida) Badia Ground Black Pepper Plementa Nagra Molida)		Mectornick Pure Browne Black Pepper CHILI POWDER Morton B Bassett Chill Powder Spice Islands Chill Powder Simply Organic Chill Powder Badia Polvo de Chill Powder Swad Chill Powder God & Gather Target Chill Powder Bebhardt Chill Powder E Bones Brown California Chill		Spice Islands Ground Corinder Morce Islands Ground Corinder Cound Corinder Power Laxmi Brand Corrinder Power Panzeys Spices Coriander Ground CUNIN Spice Islands Ground Cumin Seed Simply Organic Ground Cumin E Guago Cumin (Comino) Morton 9 Bassett Ground Cumin McCormick Ground Cumin Strik Ground Cumin	
Treat Value (Ivenant) Baell Leaves AcCornick Culinary Ground Baeil Alabanca Molida) Bausage Maker Ground Baeil Atchouse Freeze Dried Baeil Actor to Bassett Baeil BLACK PEPPER Fore* Ground Black Pepper Fore* Ground Black Pepper Forest Ground Black Pepper Forenta Nagra Molida) Baeila Ground Black Pepper Formenta Nagra Molida) Cateborne Ground Black Pepper Formenta Nagra Molida) Cateborne Ground Black Pepper Formenta Nagra Molida) Cateborne Ground Black Pepper Formenta Nagra Molida Cateborne Ground Black Pepper Formenta Nagra Molida) Cateborne Ground Black Pepper Formenta Nagra Molida) Cateborne Ground Black Pepper Formenta Nagra Molida		McCorreik Pure Ground Black Pepper > CHILL POWDER Morton & Bassett Chill Powder Spice Islands Chill Powder Simply Organic Chill Powder Badia Polvo de Chill Powder Swad Chill Powder Good & Gather (Taraet) Chill Powder Gebhardt Chill Powder Belange Ground California Bhill Chill California Mailde		spice Islands Ground Corinder Morton B Basett Ground Corinder Powder Panzeys Spices Coriander Ground CUMIN Spice Islands Ground Cumin Seed Sinej Organic Ground Cumin El Guapo Cumin (Comino) Morton B Basett Ground Cumin McCormick Ground Cumin McCormick Ground Cumin Stoydel Fools Markat Cumin Browd	
Ereat Value (Ivenard) Baell Leaves AcCornick Cultury Ground Baell Alabanas Molida) Bausage Maker Ground Basil Itchouse Freeze Dried Basil Bausage Maker Ground Basil Bitch Bassett Basil BLACK PEPPER Forman Singen Molida) Bada Ground Black Pepper Finnenta Negra Molida) Bada Ground Black Pepper Finnenta Negra Molida Bada Ground Black Pepper Finnenta Negra Finnenta Finnenta Negra Finnenta Finn		Area Browned Black Pepper Pure Browned Black Pepper CHILL POWDER Morton & Bassett Chill Powder Spice Jalands Chill Powder Badia Polvo de Chill Powder Badia Polvo de Chill Powder Swad Chill Powder Good & Gather (Tarant) Chill Powder E Guapa Ground California Chill Chell Carloren Medida McCormick (Jark Chill Powder Entit Powder Entit Powder Entit Powder El Guapa Ground California Chill Chell Carloren Medida McCormick (Jark Chill Powder Entit Powder Entit Powder Entit Powder Entit Powder El Guapa Ground California Chill Chell Carloren Medida McCormick (Jark Chill Powder Entit Entit Powder Entit Powder Entit Powder Entit		spice Islands Ground Corinder Morton 8 Basett Ground Corlander Laxmi Brand Corrlander Powder Penzeys Spices Corlander Ground CUNIIN Spice Islands Ground Cumin Signey Organic Ground Cumin El Guapo Cumin (Comino) Morton 8 Basett Ground Cumin McCormick Ground Cumin Stround Biolar's Flesta Ground Comino Comminy	
reat Value (wenard Banil Leaves AcCornick Cullinary Ground Banil Mahana Molida Jausaga Maker Ground Banil Mortan & Bassett Banil Jausaga Maker Ground Bani Mortan & Bassett Banil BLACK PEPPER Second Black Pepper Formet Nogra Molidal Dadie Ground Black Pepper Primeta Nogra Balik Pepper Primeta Nogra Dadie Ground Black Pepper Primeta Nogra Molidal Drashiana Ground Black Pepper Primeta Nogra Molidal Drashiana Ground Black Pepper Primate Nogra		McCornick Pure Bround Black Pepper > CHILL POWDER Morton & Bassett Chill Powder Simply Grganic Chill Powder Badle Polvo de Chill Powder Swad Chill Powder Good & Gather Tweet Chill Powder Gebhartt Chill Powder E Guago Ground California Chill Chil Cornick Dark Chill Powder Graet Value Insimant) Chill Powder		spice Islands Ground Corinder Morton 5 Basett Bround Corlander Laxmil Brand Corrlander Pewder Panzeys Spices Corlander Ground CUMIN Spice Islands Ground Cumin Seed Simply Organic Ground Cumin El Guapo Cumin (Comino) Morton 5 Basett Bround Cumin McCormick Ground Cumin Bodia Froand Cumin Bround Boher's Firsts Ground Comino (Cumin) Badia Ground Cumin Comino Midio)*	
reat Value (wenam) Banil Leaves deCornick Culinary Ground Banil Mahana Molida Jausage Maker Ground Banil Mathema Karang Maker Ground Bani BLACK PEPPER BLACK PEPPER BLACK PEPPER Banis Ground Black Pepper Primeta Negra Molidal Dealis Ground Black Pepper Primeta Negra Molidal Dealis Ground Black Pepper Primeta Negra Molidal Dealistic Ground Black Pepper Primeta Cound Black Pepper Ingenic Ground Black Pepper Ingenic Ground Black Pepper Janis Cound Black Pepper		McCornick Pare Bround Black Pepper > CHILL POWDER Morton & Bassett Chill Powder Spice Islands Chill Powder Badia Polvo de Chill Powder Badia Polvo de Chill Powder Badia Polvo de Chill Powder Good & Gather (huget) Chill Powder E Gougo Ground Cultornia Chill Chill California Molidal McCornick Dark Chill Powder Graat Value (wannet) Chill Powder Chill Powder Graat Value (wannet) Chill Powder		spice Islands Ground Corinder Morton 5 Basett Bround Corlander Devider Laxmi Brand Corrlander Pewder Penzeys Spices Corlander Ground CUMIN Spice Islands Ground Cumin Seed Simply Organic Bround Cumin El Buago Cumin (Comino) Morton 5 Bassett Ground Cumin 365 Whole Fodd Market Cumin Ground Bohar's Filesta Bround Comino (Cumin) Badia Ground Cumin Badia Ground Cumin Ground Comino Midio)	
reat Value (venant) Beall Leaves teCornick Cullinary Ground Beall Nubanca Molical ausage Maker Ground Beall Norton 5 Bassett Beall Pice Salands Sweet Beall BEACK PEPPER BEACK PEPPER Damp Black Pepper Found Black Pepper Buage Black Pepper Buage Black Pepper Statemat Nature Molical Sate Saland Black Pepper Particular Black Pepper Trained Black Pepper Trikland Blach Pepper Trikland Blach Pepper Trikland Blach Pepper Imply Organic Black Pepper Imply Organic Black Pepper		Mectornick Para Browno Black Pepper > CHILL POWDER Morton & Bassett Chill Powder Spice Islands Chill Powder Badia Polvo de Chill Powder Badia Polvo de Chill Powder Badia Polvo de Chill Powder Bodo & Gather (Taget) Chill Powder Bodoardt Chill Powder Bodoardt Chill Powder Bodoardt Chill Powder Bodoardt Chill Powder Bodoardt Chill Powder Bodoardt Chill Powder Brant Value (manard) Chill Powder Sreat Value (manard) Chill Powder		Spree Stands Ground Corinder More Stands Ground Corinder Caxmi Brand Corriander Pewder Penzeys Spices Coriander Ground CUNIN Spice Islands Ground Cumin Seed Simply Organic Ground Cumin El Buago Cumin (Comino) Morton B Bassett Bround Cumin BS Whole Foods Market Cumin Ground Bd Ground Cumin Bd Ground Cumin Bd Ground Cumin Citoment Ground Citoment Foods Market Cumin Ground Citoment Foods Market Cumin Ground Citoment Foods Ground Cumin Bd Ground Cumin Bround Citoment Foods Ground Cumin Foods Ground Cumin Foods Ground Cumin Commo Midda) Greet Value (prenet) Frade Jobe Organic Ground Cumin Frade Jobe Organic Ground Cumin	
react Value Invenent Beall Leaves Informatic Durinary Ground Beall University Control Beall University Cristians Internet Research Crist Beall Internet Research Beall BLACK PEPPER BLACK PEPPER BLACK PEPPER Despond Black Pepper I Guapo Black Pepper I Guapo Black Pepper I Guapo Black Pepper Internet Negra Moldal Geneticane Ground Black Pepper Internet Negra Black Pepper		Metornik Back Pepper Pure Ground Black Pepper > CHILL POWDER Morton B Bassett Chill Powder Spice Islands Chill Powder Badia Polvo de Chill Powder Badia Polvo de Chill Powder Swad Chill Powder Good S Gather (Tarjett Chill Powder Gebbardt Chill Powder Hongorie Chill Powder Hongorie Chill Powder Hongorie Chill Powder Gebbardt Chill Powder Hongorie Chill Powder Gebbardt Chill Powder Gebbardt Chill Powder Hongorie Chill Powder Graet Yales mammat Chill Powder Corrack Dark Chill Powder Graet Yales mammat Chill Powder Corrack Dark Chill Powder Graet Yales mammat Chill Powder Corrack Dark Chill Powder Gebbardt Chill Powder Graet Yales mammat Chill Powder Corrack Dark Chill Powder Chill Powder Chil		sprec Islands Ground Corlinder More Islands Ground Corlander Powder Cound Corlander Powder Panzeys Spices Corlander Forund CUNIN Spice Islands Ground Cumin Seed Simply Organic Bround Cumin Isl Guape Cumin (Comino) Morton 9 Bassett Ground Cumin McCormick Ground Cumin McCormick Ground Cumin Generic Flests Bround Comino Boder Freide Bround Comino Comino Molico) Greet Value (Minawai Ground Cumin' Trader Look Ground Cumin'	





and the state of the state

University of California

1

Agriculture and Natural Resources UCCE Master Gardener Program

NOTE TO SELF:

- Buy and plant
 - African Blue Basil
 - Oregano
 - Golden Oregano
 - French Thyme
 - Lemon Thyme





University of California

Agriculture and Natural Resources UCCE Master Gardener Program

And if That Weren't Enough in the CONCERN File:

- Consumer Reports February 2023 tested 23 brands of chocolate bar
- All samples had concerning levels of cadmium and lead
- One ounce a day would put an adult over a level that public health authorities and CR's experts say may be harmful for at least one of those heavy metals.
- There are risks for young, the pregnant, and folks of any age



Did Bugs Bunny and Popeye Share that CONCERN?

- "Frequent exposure to lead can lead to nervous system problems, hypertension, immune system suppression, kidney damage, and reproductive issues...
- Cadmium and lead are also present in sweet potatoes, spinach and carrots*. Small amounts from multiple sources can add up to dangerous levels. That's why it's important to limit exposure when you can."
- * from contaminated irrigation to soil to veg





Walking Along

A Sidewalk In OB



Eye Height



University of California

Agriculture and Natural Resources UCCE Master Gardener Program

USDA Organics By the Book

For example, the use of most synthetic pesticides and fertilizers, growth hormones, sewage sludge, irradiation, and genetic engineering (genetically modified organisms or GMOs) are prohibited

Copper sulfate—for use as an algicide in aquatic rice systems, is limited to one application per field during any 24-month period.

Chlorine materials—For pre-harvest use, residual chlorine levels in the water in direct crop contact or as water from cleaning irrigation systems applied to soil must not exceed the maximum residual disinfectant limit under the Safe Drinking Water Act Peracetic acid—for use in disinfecting equipment, seed, and asexually propagated planting material. Also permitted in hydrogen peroxide formulations Sodium carbonate peroxyhydrate WITH RESTRICTIONS Herbicides, soap-based As insecticides (ALL WITH RESTRITIONS) -(1) Ammonium carbonate (2) Aqueous potassium silicate (CAS #–1312–76–1)(3) Boric acid



USDA Organics By the Book

Elemental sulfur.

(6) Lime sulfur—including calcium polysulfide.

(7) Oils, horticultural—narrow range oils as dormant,

suffocating, and summer oils.

(8) Soaps, insecticidal.

As plant disease control.

(1) Aqueous potassium silicate (CAS #–1312–76–1)—the silica, used in the manufacture of potassium silicate, must be sourced from naturally occurring sand.

(2) Coppers, fixed—copper hydroxide, copper oxide, copper oxychloride, includes products exempted from EPA tolerance, *Provided*, That, copper-based materials must be used in a manner that minimizes accumulation in the soil and shall not be used as herbicides.

(3) Copper sulfate—Substance must be used in a manner that minimizes accumulation of copper in the soil.



Time to Check on USDA Organics

- Certified Organic products may contain residues up to specified limits.
- The organic farmer is not constrained in his application, only in his choice: See and Spray is fast and effective.
- Organic growing is an economic activity just like regular farming, driven by profit motive.



Conclusions

<u>Learn the dangerous plants from your text</u>. Use the online pdf as an equivalent source https://ucanr.edu/sites/poisonous_safe_plants/files/154528.pdf

Become familiar with alternate sources of toxicity in the food chain Contamination from pharmaceuticals through food sources through water sources via innocent carriers Contamination from manure and organic sources Contamination from heavy metals and other chemicals found in nearby sources Be aware of sources of pesticide contamination and how they can spread into and through the food chain

Be wary of all the claims, both bad and good. We don't yet fully know all there is to know about how toxics work in the body, nor how extensive the contamination problem is in the environment.



THANK YOU!

Questions?



University of California Agriculture and Natural Resources UCCE Master Gardener Program

Contact Us

QUESTIONS? CALL SAN DIEGO MASTER GARDENERS AT 858-822-6910, or email help@mastergardenerssandiego.org www.mastergardenerssandiego.org for Earth Friendly Garden program and extensive material on home gardening



University of California Agriculture and Natural Resources UCCE Master Gardener Program