THE REGULAR, AND NOT SO REGULAR, NEWSLETTER
OF THE GARLIC SEED FOUNDATION

The Garlic Press

www.garlicseedfoundation.info
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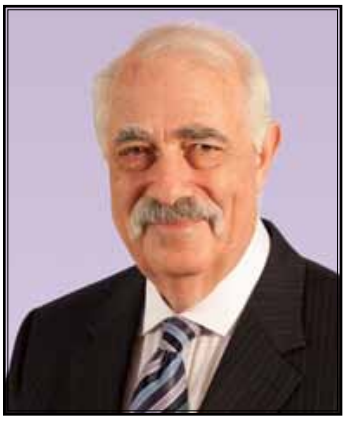
In this issue we are paying tribute to two old friends of The Foundation who have had profound effects on our process of learning and teaching. One is Pat Reppart of Shale Hill Herb Farm who invited David and I many years ago to her house for a 40 clove chicken dinner and from there almost 30 years later we still honor her for beginning the process that became **The Hudson Valley Garlic Festival**. Sadly, Pat passed away in late December but her joyful laugh and wonderful recipes will be with us still.The other is our good friend and amazing sulfur chemist Eric Block. Retiring from 40 years at SUNY Albany. Eric is moving to the West Coast where he will be a visiting professor at UCLA. Enough could not be said about the groundbreaking research he has sponsored on garlic and sulfur science. Kudos to them both and may you enjoy their stories



ERIC BLOCK

I've often wondered how or why we became friends, for we shared only one common object of interest in worlds as different as night and day: backgrounds, religions, educational levels, social and professional goals and status, urban/rural, white collar/ blue collar, smooth soft hands/rough callused claws, University Distinguished Professor and Department Chairman and a dirt farmer.

But there I sat, in a thick red leather chair at a conference table in the Chairman's private office, dark wood paneled with books and ancient scientific instruments on every bookshelf on every wall. As my eyes wandered about this strange world, I noticed

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PAT REPPERT

Patti Reppert was a big woman...a big smile, big heart, big ideas and big visions. We met on the Ag Quad at a Specialty Crops Conference at Cornell back in 1987, and she was on a quest. "I'm from Shale Hill Farm in the Hudson Valley and need a speaker for my Herb & Garlic Festival" I never said no to Patti, never could. Those first festivals were held at her home / farm, which were quickly overrun with crowds growing from 100 to 450 to 1500 people.

We talked at night: what was happening? There was a lot of consumer interest and the GSF had garlic producers...that night we planted the seeds for the Hudson Valley Garlic Festival.

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THE GARLIC PRESS

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ERIC BLOCK continued

a garlic bulb on the brass plate of a beam scale from the 1800's. Another bulb on another instrument, and another...on each of the chemist's tools on display! The Chairman, a portly, distinguished gentleman: proper, polite and confident on his home turf, white hair and bushy mustache, in a tailored suit with slightly clashing shirt and wide tie flaunting an embroidered bulb of garlic!

Eric Block, PhD, Distinguished (we're talking top shelf / world class here folks) Sulfur Chemist, Department Chair, SUNY Albany meets Cornell Vegetable Agent Roger Kline and David Stern, Woodchuck, in1987. Roger (RAK) had stolen a Cornell pick-up truck from the motor pool and we were off on one of our periodic "road trips" to observe and learn about garlic and small scale vegetable production in New England. Our first stop was to pick up a Troy Bilt rototiller from the factory in Troy (across the river from Albany) that Roger had sweet-talked into donating for a 4-H project, then off to SUNY. We weren't sure what to expect when we'd made the appointment and walked into academia, but we walked out laughing, heads full of information, and happy for our new comrad.

During our meeting, Roger or I would ask a question and Eric would reply for 20 minutes as my head exploded, trying to comprehend and retain all Eric was telling us. I stopped trying to take notes. He openly shared his knowledge and his time, and for the first time I thought about this plant at the molecular level: carbohydrates, amino acids, and all of the exciting explosions and chemical reactions that take place when you crush this stinky stuff. But when you're a sulfur chemist, this is love. Garlic has a higher percentage of sulfur than any other plant, far ahead of the other Alliums and Brassicas.
The plant accumulates it from the air, water and soil. Stored in the cloves, sulfur is responsible for the flavors, medicinals and the magic. We've cultivated this plant for 5000 years and it has a history, with tales from the kitchen to the battlefields, hospitals to bedrooms.

And through the hours we spent together that afternoon, we became friends with this distinguished professor who traveled the world collecting garlic to test, who has patents on garlic-infused plastics used in prosthetics and implanted body parts, who consults with many pharmaceutical companies. He has authored and co-authored books and 100+ papers (look him up on your e-toys). He also raised two children with his wife Judy.

On the back end of his lecture, I was able to interrupt enough to get him into the important stuff: what's your favorite garlic dish (roasted); did he garden/grow his own (no, but he'd seen the CA Central Valley). I told him Rose Valley grew less than 10,000 acres. Roger and I took turns helping him understand that there was a lot more to know about garlic, what an interesting and unique plant it is to grow, and the importance of garlic farmers who have carried it from the past and into the future.

In 1990, Eric invited me to attend the First World Garlic Congress in Washington, D.C. focusing on health effects and products. So now, this woodchuck is in the middle of a food fight between the Germans, who produce the garlic product Kwaii, and the Japanese, who produce Kyolic, and learned professors like Eric, who present papers showing both pill products are worthless. I was hoping they'd put on the boxing gloves, but it never got that exciting. Eric took me under his wing to explain the rules of this game, where you can rip apart a guy's research while sharing a drink. It's all about money/ sales and getting shoppers to think the stuff even works. Capitalism at its worst. (Eat the real stuff.) Eric is our friend. Over the years we have continued to talk and share knowledge, ideas, recipes and gossip in the world of garlic.

The Hudson Valley Garlic Festival is an hour south of Albany on the 4-lane, so we would get a visit from Eric when it didn't conflict with his religious and professional obligations. He'd always bring his latest paper or book (or reprint of his book in Chinese) to share with us--plus news and findings from the sulphur chemistry lab.

After a lapse of two or three years, I called him and learned that his wife Judy had been inflicted with cancer and the battle was on. Eric asked me to fill in for several speaking engagements he had committed to, but I never had the balls to introduce myself as E. Block, PhD. More years before we got the sad news that Judy had passed. Then more years without Eric.

But last year, we looked through the haze of faces at the Festival on a beautiful afternoon and saw: ERIC! He had returned with a big smile, more literature, a wonderful new partner, about to be remarried, and on his way to California where he'll lecture at UCLA and live close to kids and grandkids. It was such a good reunion; we even took selfies! What a happy ending for our friend.

I have two more things to share in this farewell. The first is the coincidence of Albany, where in 1944 a young chemist working in research was sent by the War Department to find more antibiotics. Chester Cavalito told me it started on the way home, at the grocery store. Alexander Fleming told us about antibiotics, but Chet discovered garlic's magic bullet compound, created when the clove is crushed: Allicin. Lastly, Roger and I ended that first meeting with Eric asking if any of these crazy medical claims that are made about garlic are really true. He said with a smile, "Oh yes, my religious book, the Talmud, states that the married couple should eat garlic on Friday night, so that they may better know each other. It flames the passions." It was Friday afternoon. (DS.com)

PAT REPPART continued

Patti talked the Town into giving her their recreational hall and baseball fields to use for the site. The first festivals were different than today's. We had a "Garlic School" for farmers and gardeners all day on Saturday (and a garlic potluck lunch) and a social event on Saturday night--either wine and cheese at the beautiful Saugerties Lighthouse (on the Hudson), or a banquet at a local food joint. The Mayor welcomed us. The first festival at Cantine Field was 15 farmers/vendors and 4,500 people. The next year we dropped the Saturday School for a 2-day festival, and the Kiwanis Club came on to help out. Pat and I continued to watch the festival grow. It's been 25+ years now, with tens of thousands of folks, 60 New England garlic farmers each year, and food, music, crafts, dancers, lectures, kid stuff, smiles and a lot of bad breath. The Festival now has a life of its own as it blooms each fall from the inspiration of Pat Reppert.

Patti is gone now, but not her spirit. She loved the garlic and garlic food, and she loved all of us for growing it. And as with all of us, there were other dimensions. She was a graduate of Duke University, a nurse in her working career, partner to "Dr. Repp" and mother to their children and grandchildren, a side-kick to Martha Stewart. She hosted a gardening radio show in the Hudson Valley for 15 years, was a member of the Garden Writers of America, and past President of the International Herb Association! In her relaxation time, she'd enjoy a "bourbon and branch" or a strawberry garlic margarita. Amen.

(DS.com)

Out of My Out of My Head

with Bob Dunkel

We need to talk. It's been a long journey for us, The Friends of Garlic. As you may well know it is over thirty years now that we have operated under the name The Garlic Seed Foundation. No funding, no corporate sponsorships and often no direction known.WE are one of a very few grass roots, grower oriented organizations and we are proud of it!....

BUT times change...

We are old school and old timers still trying to be relevant in todays fast paced cyber-tech world. It has been a long slow conversion to have a website, electronic newsletter and paypal etc. BUT we need your input! What can we do better? To be honest one issue is membership, as we have always kept folks on long after they have joined, and yet we need to have a realistic definition of membership and it does not seem to be working anymore to base it on four issues of The Garlic Press. The last issue cost us $2000 to print hard copies and send out, and the bottom line is we cannot afford to do that many issues or we would be broke. It has been a sea change of sorts having most new members convert to the electronic version and that has really helped! Our issue though is we have older members that have supported us for years and are not tech savvy and thus the cost of mailing hard copies remains. It would be nice to have some of these folks convert to the ePress but we will NEVER cut them off because we have been around a lot longer than the world wide web and cell phones took over. So where do we go from here? I ask for articles and photos from your operations and experiences but 99% of you have not responded. Now that I have been doing the Facebook page for Friends of Garlic I see that that also is a long slow road of getting conversations and questions and dialogues going. That is also frustrating and I don't know how to make that better. Ideas?

Have we lost our relevancy?

I hope not, but we really need to hear from you folks and this newsletter is still the best way to reach out. At the garlic festivals we have fun and talk with a lot of enthusiastic people that are both new to garlic as well as many that are quite experienced. At Saugerties, David Stern breaks out his classic chocolate covered garlic and there is a feeding frenzy. WE show folks how to braid and plant garlic offer tools and ideas but so many of our members we have never met in person. So, we have encouraged more and more garlic fests across the country to fill that gap. One good step forward has been for us to do Garlic Classes with folks from Cornell but this is in New York state and until we can get a crew to videotape the sessions once again most folks miss out. It would be nice to get some of you on board that know the media world today and can get us pointed in a new direction but money and expertise is limited...So, What do YOU want to see us do from here? WE started last century with ideas of chapters and meetings and pot lucks and slide shows etc...but the world changed and so we need to take a hard look at where we are and where YOU want us to go!

So, before you wander off...

how about taking a few moments and give us some thoughts and letting us know....Thanks for all you do in your communities to bring garlic into folks lives and may you enjoy this brief period of rest as we wait for those tiny tips* to emerge and bless us with this years crop!

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*as of June, tips have emerged, the beat goes on... may the circle be unbroken!

HIS STORY IS PERHAPS NOT HERS

We really do not know how old the garlic is
We are able to trace the footsteps
From where its center of origin seems to be
And that it appears in China and India and Egypt
As overland trade routes were established.
3500 BCE seems to be as far back as it is referenced
Yet as history itself is a monument to the victors
So too have we forgotten the hunters and gatherers
Those who left no temples of stone to study
Or written records and symbols...
Yet in caravans of old it was carried cross deserts
In saddlebags and in the bellies of the armies
Its protective powers were displayed.
Round gypsy fires and raucous celebrations
The stories and songs bequeathed its magical wonders.
As sad eyed monks and zealots in judgment spewed
Out in disdain its evocative energies, and aristocrats hedged
The people persisted and garlic was spread and cultivated.
Slavery was the wealth of the early wars and not territory.
Fifteen pounds of garlic was fair trade for a good slave.
As Charlemagne declared it should be cultivated throughout his empire.
That Roman Empire that spread northward in Europe graced it
With the clones of gold that our ancestors have brought to America since the 1400's
But once again this is but of late in the long unwinding of our story.

Certainly in neolithic villages and in sedentary communities
That sought out the alluvial soils and deposits of silt
Did the garlic prosper. Yet in the long nights before
Curtained by dreams and forgotten memories of cataclysms
Rising waters have buried the plant histories.
The Great Flood was but one of many versions of that
As Earth changes morphed the spores and seeds to survive.
Perhaps then that is the why of high mountains
Where in Central Asia, the Tien Shan and Himalayas
We have found that center of origin which survived...
For millennia it has strengthened our collective resolve
As one garlic farmer passed like long winters
This heritage on to generation upon generation.
Varietal names and types have only been a recent fascination
Climatic zones and changing soil types tell more the story
Of where we have been and why with us it journeyed.
Culinary infatuation was a late comer to the herbal legacy
From the Codex Ebers to Culpepper its magic was known
As medicine, whose only source was foods and herbs
Not pharmaceuticals and odorless pills...

So let us all remember to remember this story:
Our journey to health continues with garlic
and for our children and their children.
So teach and tell them how to cook and grow
To flourish and thrive and keep alive!

- bd

SCIENCE OF STINK:
Blame Sulfur Compounds For Your Garlic Breath

Posted on August 15, 2017 by dilip.k.lalwani Maanvi Singh June 21, 201410:48 AM ET

Garlic is delicious. But if you consume enough of it, its stench can repel not only vampires but any person within a 5-foot radius.

What's behind garlic breath that makes it so offensive? In a video, the folks at the American Chemical Society and the chemistry blog Compound Interest lay out the chemicals responsible for the odor.

Chopping or crushing garlic releases the compound allicin, which then breaks down into four other smelly compounds. The most mischievous of them is allyl methyl sulfide, which can linger in your body for a long time. It not only causes your breath to go rank, but as it seeps into your bloodstream, it also gets into your sweat and pee.

It can be incredibly difficult to get rid of the stench once you've ingested this chemical. "Humans and animals are exquisitely sensitive to the most tiny amounts of sulfur compounds," says Eric Block, a professor of chemistry at the State University of New York in Albany, and the author of Garlic and Other Alliums.

It makes our mouth water, but it makes our breath stink.

Once you metabolize these compounds, the smell goes away, Block tells The Salt. But that can take a while — up to two days, though it varies in each person.

Some people can break it down quickly, but "I'm not one of those," he says. "I'm a garlic lover, and my wife — who has an excellent sense of smell — says even 48 hours after eating a garlic meal, she can smell it on my skin."

Some research suggests that the fat in milk may help us break down the allyl methyl sulfide more quickly. The ACS video also suggests parsley.

But these sorts of remedies may be iffy, Block says; instead he recommends masking garlic with other strong smells.

Citrus can help, says Bhimu Patil, a horticulturist at Texas A&M University, but that's based on anecdotal evidence.

Garlic — especially when it's eaten raw — is good for you, Patil says. "Maybe eat it at night," he says. "That way you can also lead a social life."

But if you're gorging on garlic because you think it'll quash your cold or reduce your risk of getting cancer, don't get your hopes up too much.

Some preliminary studies show that garlic's antimicrobial properties may benefit our health, Patil says. And epidemiological studies that look at countries where people consume a lot of garlic suggest that it may reduce the risk of developing cancer.

But, he says, "We need to do more analysis. We need to really understand the role of these compounds in garlic — both good and bad."

And since garlic is so pungent, most of us probably don't eat enough to actually reap any major health benefits, Block says.

It does stop the spread of disease in at least one way, though, Block says. "As I once heard a comedian say, by eating garlic you'll have such bad breath that no one wants to come near you."

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https://blog.timesunion.com/tablehopping/14150/ualbany-scientists-help-solve-garlic-riddle/

EFFECTS OF GROWING TECHNIQUES
ON YIELD, GRADE, AND FUSARIUM INFESTATION LEVELS IN GARLIC

By Crystal Stewart, Eastern NY Commercial Horticulture Program and Robert Hadad, Cornell Vegetable Program

Fusarium basal rot in June
Image: Crystal Stewart

Background: Almost every garlic grower struggles to a greater or lesser extent with Fusarium diseases, which are naturally found in most soils. Two primary Fusarium diseases historically concern garlic growers: Fusarium Bulb Rot, caused by *F. proliferatum ,* causes brown to reddish sunken lesions on the bulb surface; and Fusarium Basal Rot, caused by organisms *F. culmorum,* causes the basal plate and gradually the entire bulb to break down. Because the diseases are nearly almost always present, the focus for growers and researchers alike is on management rather than eradication.

Fusarium diseases tend to be worse in fields with poor drainage, but we were unsure of the impact that other techniques such as the use of straw mulch or black plastic might have on Fusarium levels.

Fusarium Bulb Rot
Image: Crystal Stewart

We decided to trial different common and novel techniques growers use to cultivate garlic and track both the levels of Fusarium and the quality of the garlic in each approach. We separated the work into two sets of trials: one focusing on cultural changes such as variety selection, raised beds and mulches; and another focusing on inputs that growers can use to affect disease levels such as fertility and organic soil or bulb treatments. The trial including raised beds and mulches was located in the Hudson Valley and replicated in western New York, while the trial looking at inputs was located on Long Island and replicated in western New York.

During the growing season, each of the treatments was monitored for disease development as the garlic grew. Diseased garlic was sent to a Cornell lab in Geneva, NY where the Fusarium was genetically tested to see if the disease is always the same, or if there are different species or pathovars of Fusarium in different locations or situations.

In July the garlic was harvested in all four sites and brought to high tunnels to be dried. When it was dry, all the garlic was cleaned, roots and tops were trimmed, and it was graded into small (less than 1.5 inches in diameter), medium (1.5 to two inch diameter) and large (greater than two inch diameter) categories.

Samples of each treatment were kept in storage and are being assessed during the winter of 2017/18 to determine if Fusarium severity varied by treatment. Ten randomly selected cloves from ten different bulbs were rated for percent of total surface area infested with Fusarium.

This report will focus on the techniques and results used in the cultural controls trials. The results of the nitrogen fertility and organic controls will be discussed in a separate report.

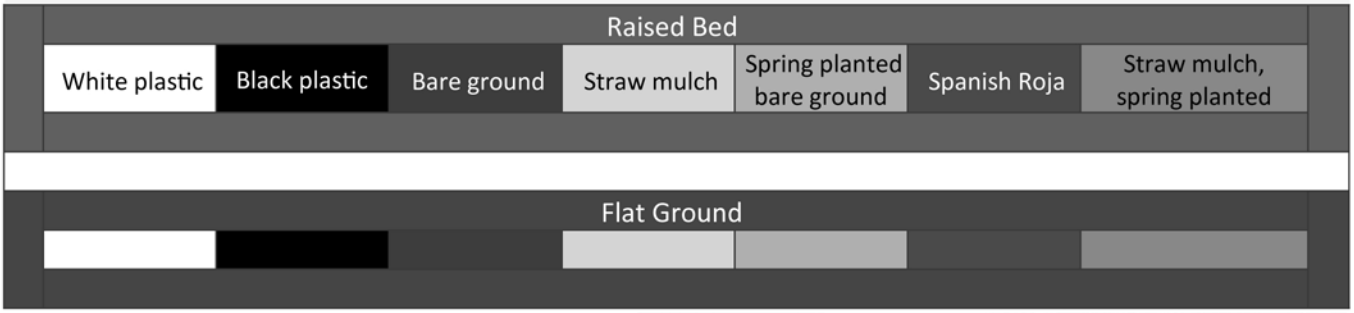
Cornell Cooperative Extension
Eastern NY Commercial Horticulture Program

NORTHEAST SARE
Sustainable Agriculture Research & Education

Trial Overview: the cultural controls trial included 9 different treatments, which are listed below. Two of the treatments, raised beds and flat ground, were blocked (not randomized) because of the difficulty of switching between raised beds and flat ground in one row. One row of the trial was a 4-inch raised bed, the other was flat ground. The other seven treatments were randomly replicated three times within the rows. Each treatment was twenty feet long, with a small buffer between treatments.

Fall planted garlic was planted in Mid-October, and spring planted garlic was planted in April. All garlic was harvested in mid July. Many of the treatments were also chosen for their excellent weed control. The bare ground treatments were regularly hand weeded so that weed pressure would not interfere with the results of the trial.

Map of the first of three replications of the garlic treatments. Following replications in the same row were randomized.



Bare Ground cultivation of garlic is common because it allows for mechanical weed control as well as side-dressing nitrogen in the spring. Mechanical weed control is very time sensitive, so growers need to be quite attentive to keep weeds from competing with the crop. In a field with high weed pressure, up to 6 cultivations may be necessary for weed control.

An additional consideration in growing garlic in a bare ground system is that the soil becomes more compacted than in a system with straw or plastic mulch.

Straw Mulch is commonly used in organic garlic production where all fertility is applied in the fall, at planting. Straw mulch can help protect garlic from freezing and thawing in the winter and spring, can moderate soil moisture and temperature, and can suppress annual weed growth. It also reduces soil compaction and contributes to soil organic matter and soil health.

Concerns about using straw mulch focus on two main issues: the potential for mulch to hold too much moisture in wet years and contribute to fungal disease issues (Fusarium); and weed control failures, which can lead to increased labor weeding compared to bare ground mechanical cultivation. We were careful to use weed-free straw, applied at about 5 inches deep in fall which compressed to 2.5 inches deep after the winter.

Black Plastic is used as another option for weed control. Moisture levels under black plastic tend to stay relatively constant, because not much rainfall makes it under the plastic and because evaporation is minimized. Black plastic also warms the soil more quickly in the spring, encouraging earlier top growth than straw mulch or bare ground systems.

There are two primary concerns that growers have about black plastic. The primary concern is that it can actually get too hot under black plastic during the growing season, restricting garlic sizing in late June and early July. The second concern is that plastic can shed snow during the winter, leaving garlic more exposed to winter injury than in other growing systems. A third concern is that in very dry years, it may be necessary to irrigate garlic under plastic, which necessitates the use of drip tape.

White plastic has similar properties to black plastic related to weed control and moisture moderation. However, because it reflects light rather than absorbing it, it keeps the soil cooler rather than warming it. This reflective property might also provide more light to the garlic. White plastic has typically been used in brassica production during parts of the growing season, but has not traditionally been used in garlic production.

White plastic may shed snow during the winter similarly to black plastic, which was a concern with this treatment as well. The effect that temperature moderation would have on early growth was a question mark with this treatment, as was the cooler soil temperature during the summer.

Variety selection plays a role in disease susceptibility and adaptability to various environments. For this trial, we selected two varieties grown by the majority of garlic growers: a Porcelain variety (German White) as our primary, and a Rocambole (Spanish Roja) as a treatment for comparison.

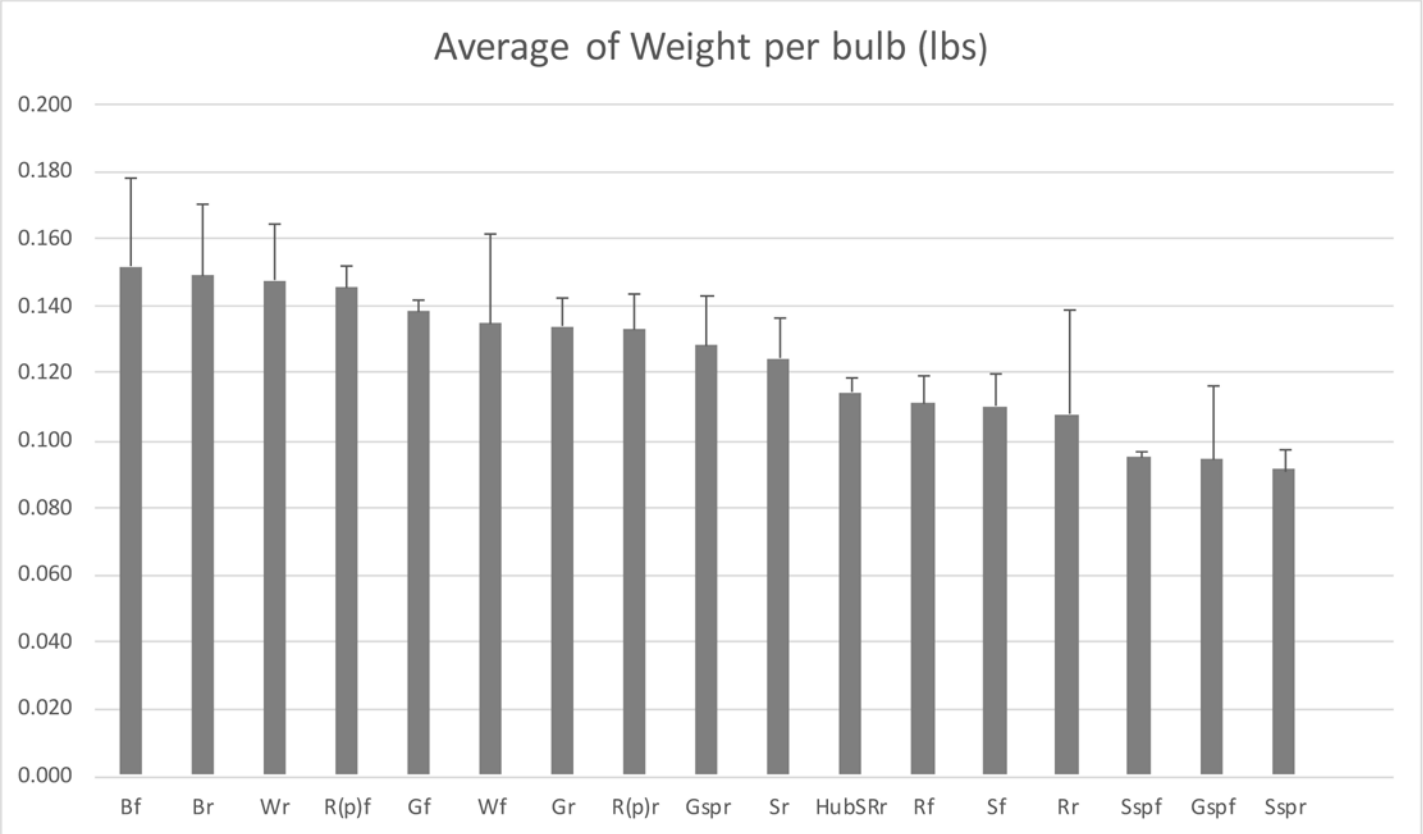
Porcelain varieties are very vigorous and perform well under most growing conditions; Rocambole varieties are often considered to have better flavor but seem more susceptible to disease under many conditions.

Spring planting of garlic is something that growers tend to avoid if possible, but occasionally we are asked if it is possible to do. We also wanted to know if winter injury is contributing to Fusarium levels on garlic. For this trial we cracked seed at planting time and then stored it in a standard refrigerator at 40 degrees F over the winter. As soon as the ground was thawed in the spring, we planted garlic into bare ground and straw mulch.

Cultural Control Trial Results:

After harvest, garlic from both the Hudson Valley and Western NY trials was dried at the Hudson Valley Farm Hub, in high tunnels. Each of the plots was kept in enough separate bags to allow for good airflow for optimum drying. All treatments had their tops clipped in the field at approximately 4 inches. When the garlic was dried, determined by the innermost wrapper leaf being dry to the touch, the marketable bulb and cull counts and weights were recorded by plot. Data analysis was based on the average weight per bulb, as well as by the size distribution. The average weight per bulb was used rather than weight per plot because some of the plots were damaged by factors not considered part of the trial, such as crows picking garlic from the mulched sections. This damage changed bulb number per plot.

The average weight per bulb metric showed black plastic providing the highest yield, followed by white plastic, bare ground, and then straw. Not surprisingly, spring planted garlic had the lowest yields.



While there are numerical differences between the treatments, only the black flat ground treatment was significantly different. White plastic (raised and flat), bare ground, and black raised were all statistically indistinguishable, and straw mulch and Spanish Roja were statistically indistinguishable from white plastic and bare ground. Only spring planted garlic was significantly smaller than all other treatments.

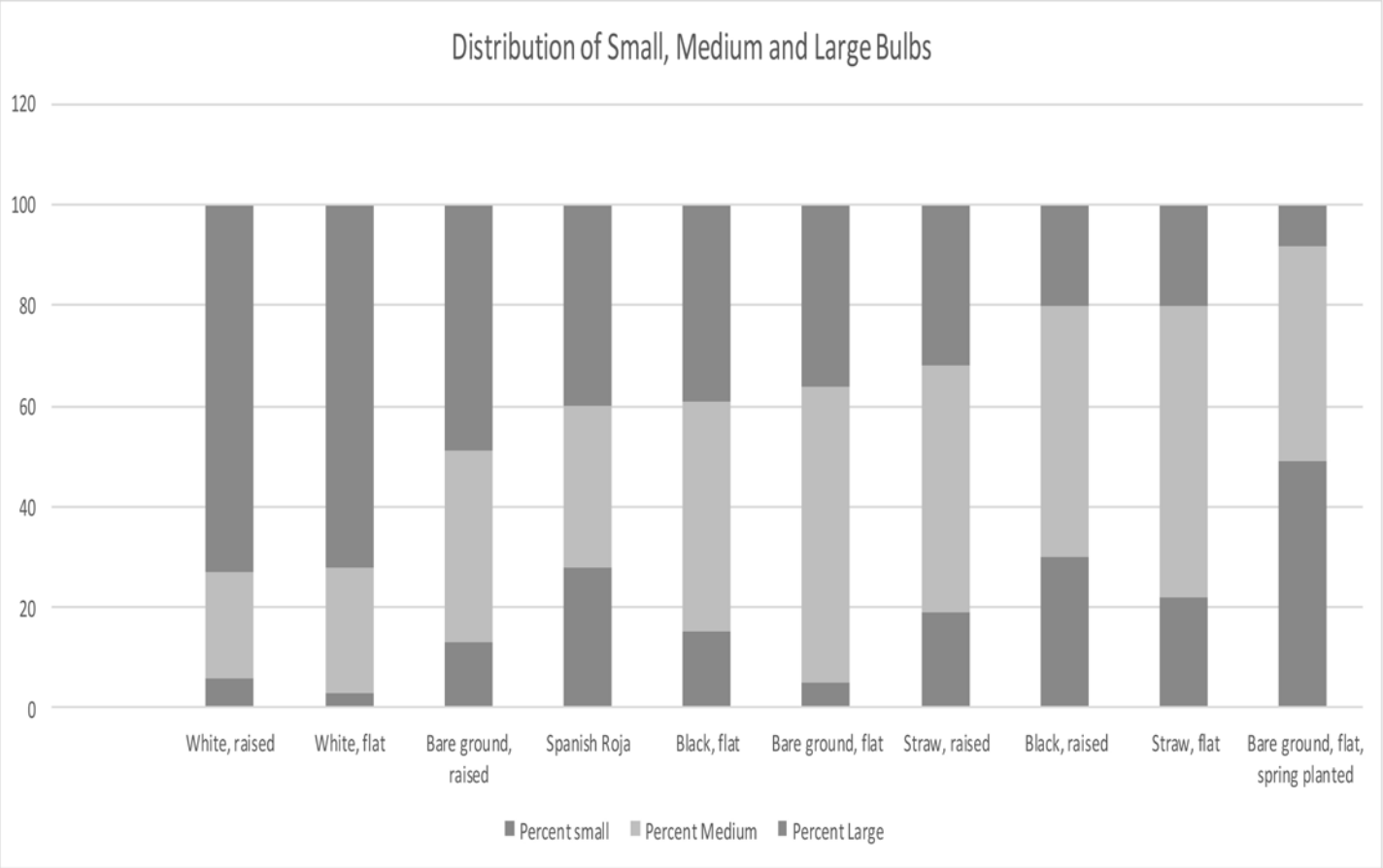
Besides total yield, we also examined the distribution of small, medium and large bulbs.

Small Bulbs: 1.5 inches or smaller

Medium Bulbs: 1.5-2 inches

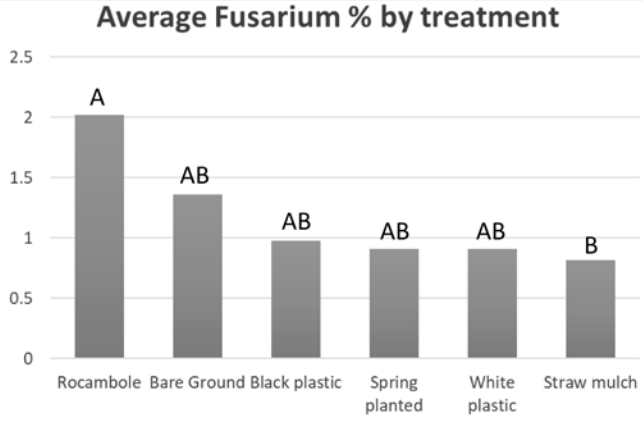
Large Bulbs: 2 inches or larger

White plastic mulch yielded the highest percentage of large bulbs on both flat ground and raised beds. Spanish Roja had the most even distribution of small, medium and large bulbs. Black plastic, raised beds, and straw mulched garlic all yielded more medium bulbs than the white plastic. Not surprisingly, the spring planted garlic yielded the most small bulbs.



Fusarium Severity Across Treatments:

To assess Fusarium severity, we selected ten cloves per rep from storage and estimated total percentage coverage with lesions. Across two sites, Fusarium levels were significantly different between the Rocambole variety and straw mulch. Other differences were numerically but not statistically different. There was no effect of raised bed versus flat ground, so during the analysis data were combined to increase the number of plots.



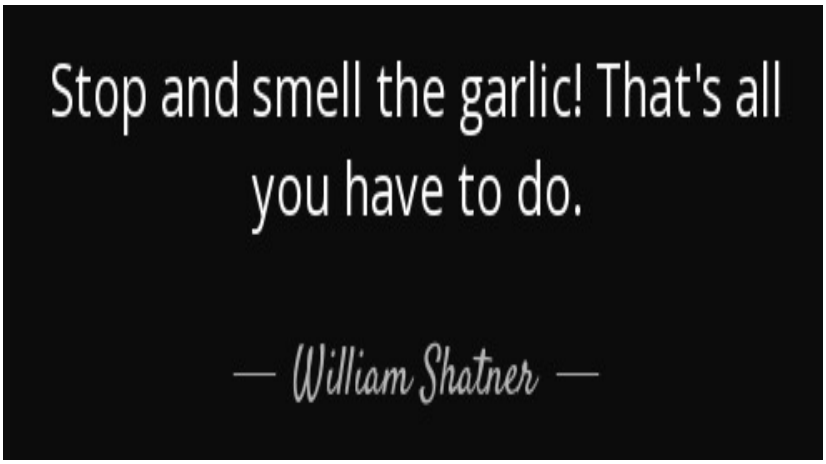
U ALBANY SCIENTISTS HELP SOLVE GARLIC RIDDLE

By Steve Barnes, senior writer on March 22, 2010 at 10:46 AM

A head of garlic in its papery skin is relatively odorless. But crushing or slicing a clove — or, egad, chewing on one — produces that distinctive, pungent aroma.

What happens to garlic at the precise moment you cut it? The seemingly simple question has challenged food scientists and chemists for more than 50 years.

A research team led by University Albany chemistry professor Eric Block, using instrumentation at the JEOL USA laboratories in Peabody, Mass., solved the mystery by detecting the key compound involved. They measured its fraction-of-a-second lifetime using a new type of instrument called a DART (Direct Analysis in Real Time) mass spectrometer, or DART-MS.



Intact garlic contains the odorless sulfoxide alliin. Cutting garlic releases the enzyme alliinase, which breaks down the alliin, rapidly forming the garlicky-smelling allicin. Scientists had long believed 2- propenesulfenic acid, thought to be a powerful antioxidant formed from garlic, intervened between the alliin and allicin, but its existence had never been proved — until now.

Through use of the DART-MS, Block and his JEOL coworkers observed what happens when a garlic clove is poked with a glass tube. Using fast data collection, 2-propenesulfenic acid was observed forming and then disappearing within a fraction of a second.

Other breakdown products of alliin and allicin were observed at the same time, consistent with their formation upon crushing garlic.

Block's National Science Foundation-sponsored work is reported in the latest edition of Journal of Agricultural and Food Chemistry, as well as, in part, in his just-published "Garlic and Other Alliums: The Lore and the Science" (Royal Society of Chemistry/ Springer, 2010).

"I was amazed at how fast these processes occur. Our direct detection of 2-propenesulfenic acid is significant because many of the beneficial antioxidant properties of allicin are in fact attributed to 2-propenesulfenic acid," Block said in a news release. "The stinky compounds from garlic are defensive compounds, since allicin is a repellent for nematodes (crop-destroying microscopic worms) as well as birds."

Block also found using DART-MS that elephant garlic, a larger and milder relative of garlic, formed both allicin and propanethial S-oxide, the tear-producing compound from onion (onion lachrymatory factor, or LF).

Block said, "I was surprised to find that elephant garlic is not just a milder form of garlic as previously thought, but in fact is a unique plant, combining garlic- and onion-type compounds, and it therefore should have a somewhat different taste than garlic. Holding up crushed elephant garlic to our eyes caused tearing, which does not occur with crushed garlic itself."

Paper co-authors and researchers included JEOL Scientists Dr. Robert B. Cody and Dr. A. John Dane, and Postdoctoral Fellow Siji Thomas, of the Department of Chemistry at the University at Albany.

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https://blog.timesunion.com/tablehopping/14150/ualbany-scientists-help-solve-garlic-riddle/

Invasives

Allium Leafminer (Phytomyza Gymnostoma Loew)

by Lisa Gee

There is a new pest on the horizon and we need to be on the watch out for it. This leafminer was first described in 1858 and is native to Poland and Germany. The first confirmed case in the Western Hemisphere was in December 2015 in Lancaster County, PA. It is more likely to affect organic, non-commercial farms and homeowner gardens.

Allium leafminer, as the name suggest, likes host plants of leeks, onions, garlic, chives, shallots and green onions. It is not known how they may affect ornamental species at this time. It has been found that there are high rates of infestation from 20-100 pupae per plant. Damage from the feeding and mining soften the plant parts and leave the plant susceptible to bacterial and fungal infestation.

The adult females leave repeated punctures in the leaf tissue, with their ovipositor, in a linear pattern towards the distal end of the leaves. This may be the first sign of damage to the plant. The leaves may be wavy, curled or distorted. The males and females feed on the exudate of the plant. The larvae mine the leaves and move into the bulbs and leaf sheathes where they pupate. You will have to pull the leaves back to find the insect. The pupae can overwinter either in plant tissue or the soil. There are two generations of leafminers with the first generation emerging in September and October and the second generation overwintering and emerging March to May.

Adults are small, 3mm, grey or mat-black colored flies with a yellow or orange patch on the top and front. They also have yellow on the side of the abdomen and on the "knees" of the leg. There are white halteres and the wings are horizontal over the abdomen. Eggs are 0.5mm and white. The larvae are white, cream or yellowish headless maggots up to 8mm long at the final instar. The pupae are dark brown, 3.5mm, with posterior spiracles.

The management of this pest can include yellow sticky cards, a yellow bowl with soapy water, delaying of planting until after mid-May and covering plants in February and again when the second generation are due to emerge. Of course there are systemic and contact insecticides as well. Remember to read all labels to make sure the insecticide will treat what you want it to and that you are applying it correctly at the right time.

If you suspect that you may have this new pest notify the Department of Agriculture office or the Cooperative Extension.

Cornell University
Cooperative Extension
Erie County

Master Gardener
Cornell Cooperative Extension

21 South Grove Street
East Aurora, NY 14052

Allium leaf minear pupa extract from leek.
Photo credit: L.Donovall, USDA APHIS
www.agriculture.pa.gov

Photo credit: Sven Spichiger, Pennsylvania Department of Agriculture.
www.agriculture.pa.gov

Photo credit:
www.agriculture.pa.gov

HAVE YOU SEEN THE SERIES "ROTTEN" ON NETFLIX?

Many of you folks have perhaps already seen this series which exposes serious issues in the food industry, and there is a section on Garlic, called Garlic Breath. It takes a look at production of garlic in China and impacts anti-dumping policies that are used by customs when imported garlic reaches our shores.

Well it so happens that one of our members, Stanley Crawford of El Bosque garlic farm in New Mexico is one of the folks in this segment. Below will be a statement from him and a short article about the issues. On October of last year as part of the sunset series of Anti-dumping decisions on Chinese garlic the IRC International Trade Commission " determined that revocation of the antidumping duty order AD order) on fresh garlic from the People's Republic of China (PRC) would likely lead to a continuation or recurrence of dumping and material injury to an industry in the United States. Therefore, the Department is publishing a notice of continuation of this AD order effective Nov 6 2017"

GARLIC PRODUCTION IN CHINA

From Wikipedia, the free encyclopedia

Garlic output in 2005 shown as a percentage of the top producer, China. Garlic production in China is significant to the worldwide garlic industry, as China provides 80% of the total world production and is leading exporter. Following China, other significant garlic producers include India (5% of world production) and Bangladesh (1%). As of 2016, China produced 21 million tonnes annually.

This is a complex issue and it takes a little investigation and space that we do not have to cover the many aspects but there has been discussions online in growers forums for those interested and also remember that our Facebook page/ https://www.facebook.com/Friends-of-Garlic-652554388205736/?ref=bookmarks/ is always a place to look and comment and take this discussion down the road as it does affect all of us in the industry...

AN INTERNATIONAL GARLIC SAGA

Stanley Crawford

For the past three years I have been formally urging the U. S. Department of Commerce to review the duty rate of the largest importer of Chinese garlic. My El Bosque Garlic Farm in northern New Mexico is small—a little over an acre in garlic—but as commercial operation I have the right to file what is called a Request for Administrative Review.

Harmoni Spice has paid no anti-dumping duty for the past 13 years, through legally gaming the system with the collaboration of Christopher Ranch and the Fresh Garlic Producers Association (of California). This has enabled Harmoni to attain a monopoly position in imported Chinese garlic. China, of course, is overwhelmingly the largest producer of garlic in the world. The current wholesale price of garlic in China is about one dollar a kilo. Last summer, I found Harmoni garlic selling in Santa Fe for about $4 a pound.

The purpose of the anti-dumping law is to impose duties that will raise the price of imports to be more in line with those charged by domestic producers, in order to protect U.S. jobs and production capacity. Some two hundred products are subject to anti-dumping duties.

I have been assisted in my efforts by international trade attorney Robert Hume, now of Taos, NM; he has forty-years' experience in the business. Harmoni has fought our efforts in unprecedented ways: it filed a racketeering suit against us and twenty others; it has attacked Hume personally with other lawsuits involving an embezzling former office manager, whose legal fees are being paid by Harmoni; it bought off for an undisclosed sum a former garlic growing partner in our efforts. Harmoni has spent an estimated ten to fifteen million dollars fighting my little garlic patch; some dozen law firms are involved directly and as consultants. The various issues are being contested in the federal Court of International Trade in New York; U. S. District Court in Los Angeles; NM State District Court in Taos; and of course with the U. S. Department of Commerce. A preliminary finding in the summer of 2016 by Commerce determined in effect that Harmoni owed over $200,000,000 in duties for 2015. The finding was reversed in the summer of 2017, based on false allegations made by our former partner. Attorney Hume believes that the unprecedented effort by Harmoni to avoid being reviewed by Commerce after thirteen years of not being reviewed is owing to the possibility they are hiding something major.

A Notice by the
International Trade Commission
10/24/2017

FRESH GARLIC FROM CHINA

–––––DETERMINATION–––––

On the basis of the record [1] developed in the subject five-year review, the United States International Trade Commission ("Commission") determines, pursuant to the Tariff Act of 1930 ("the Act"), that revocation of the antidumping duty order on fresh garlic from China would be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time.

On January 5 of this year, Netflix released a six part series entitled ROTTEN. Episode 3, "Garlic Breath," covers the saga in some detail. It includes credible accusations that Harmoni uses prison labor to peel garlic supplied to Christopher Ranch. Other than a couple of minor inaccuracies and omissions (notably the $200 million above), it is an accurate account of events up to summer of 2017, when it was filmed in NM, New Jersey, and in China.

Crawford has been growing garlic in northern NM since the 1970s and is the author of A Garlic Testament: Seasons on a Small New Mexico Farm (University of New Mexico Press). His website is www.stanleycrawford.net

WE LOST—AS DID U.S. GARLIC GROWERS LARGE AND SMALL

On June 8, 2017, the U.S. Department of Commerce reversed its preliminary finding and rescinded the 21st Administrative Review of Harmoni Spice, which was initiated by the two-member New Mexico Garlic Growers' Coalition in late 2015. As a result, Harmoni continues to be able to import garlic from China paying no anti-dumping duty, as it has for the past 10 years. The Commerce decision will enable Harmoni to solidify its position as the dominant importer of garlic. American growers, large and small, will be unable to compete with Harmoni garlic, which wholesales in the U.S. for $1.70 a pound.

I believe the decision was made under political influence, probably by the California congressional delegation, no doubt under the thumbs of Christopher Ranch and its allies, who have contributed $146,889 to Republican campaigns, including the Tea Party, over the past six years. On my behalf, my attorney friend Ted Hume is contesting the decision in the (Federal) Court of International Trade in New York.

Harmoni Spice has been truly desperate throughout the past 18 months of the review, filing thousands of pages against the New Mexico Garlic Growers' Coalition, suing us and 20 others in US District Court in Los Angeles, which threw out most of the suit as a Strategic Lawsuit against Public Participation. When Commerce recognized my El Bosque Garlic Farm's standing as a producer of garlic, Harmoni was then obligated to submit to an audit—which it walked away from. Commerce issued a preliminary finding in December 2016 against Harmoni. This subjected Harmoni to anti-dumping duties of potentially $200 million-plus for 2015. Harmoni sued U.S. Customs and Border Protection in the Court of International Trade to try to avoid paying a bond to cover the potential duty, but they lost. The Court cited their record of making bad business decisions, such as failing to file the audit.

By spending what we estimate to be $10-$15 million to contest us in multiple administrative and legal forums, it is clear that Harmoni Spice has something to hide. They have personally gone after attorney Hume, funding cases against him through his former office manager. It is also clear that Harmoni Spice and its allies do not want a sole practitioner attorney representing a small family farm to participate in an arena now dominated by large corporations and corporate law firms, which have learned how to game the anti-dumping system to the benefit of a few large domestic producers teaming up with Chinese importers. Many products are involved besides garlic.

Harmoni successfully suborned a former member of the New Mexico Garlic Growers' Coalition and a former office manager of Ted Hume, paying them to testify against us. Credence was given to their paid testimony in the final ruling; our testimony was deemed not credible, despite verifiable records to back up my position as a producer of garlic. Two other garlic growers, outraged at Harmoni's machinations, have joined me in submitting a Request for Administrative Review for the next review period, which covers 2016 garlic imports. We met with the U. S. Department of Commerce in Washington D. C. on July 20th to point out how the anti-dumping system had been corrupted by Harmoni's behavior over the past ten years.

There are perhaps ten law firms circling our one-acre-plus of garlic, including Harmoni's two large international firms. Whatever is at stake, it is very big for Harmoni and its allies. What's at stake for me is the ability to petition the government for redress of grievances without being maligned and defamed—on the chance that if anti-dumping duties are finally imposed, the price of imported garlic will rise significantly. Over the course of time spent in China, I have established relations with two Chinese importers, whose interest is to see every importer paying similar anti-dumping duties, high or low.

A major documentary on the case will be released in February or 2018, for which Harmoni and Christopher Ranch declined to be interviewed.

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Stan Crawford, El Bosque Garlic Farm
crawfordstanley@gmail.com

TOP IMPORTER COULD LOSE TARIFF-FREE ADVANTAGE.
Competitors Raise Stink Over Garlic

By Henry Meier / Monday, April 11, 2016

The U.S. headquarters of Harmoni International Spice Inc., the nation's largest importer of garlic from China, stands amid a row of inconspicuous beige warehouses on the outskirts of City of Industry. But that drab exterior belies the drama playing out in Los Angeles, Washington, D.C., and China as competitors seek to overturn Harmoni's longstanding place as the lone Chinese garlic importer to be exempted from American anti-dumping import tariffs.

If its coveted status is lost and Harmoni is forced to pay those duties, which could boost the cost of its imports by nearly 400 percent, the world of imported Chinese garlic could be thrown into disarray.

Underpinning the dispute are loopholes in the regulations governing the U.S.' controversial, decades-long attempt to prevent cheap Chinese goods from undercutting domestic producers and manufacturers.

"The whole system certainly smells to high heaven," said Bill Perry, a Seattle-based partner at Dorsey & Whitney who has spent four decades navigating international trade cases for clients on both sides of the Pacific.

The system of so-called anti-dumping tariffs in the garlic industry is controlled by a small number of actors and, typically, is very stable. But a request to review Harmoni's business threatens to upend the industry.

The review process is intended to evaluate whether companies shipping garlic from China to the United States are selling it at below market rate or skirting tariff obligations. There are four importers, including Harmoni, that import garlic at tariff rates below the 376 percent cash deposit rate set by the U.S. government in 1994. That tariff effectively raises the price of garlic brought in from China by $4.71 a kilo, or a little more than $2 a pound, making it competitive with the cost of domestically grown garlic.

Though it could not be determined exactly how much garlic Harmoni brings into the United States each year, the importer and its competitors agree the Harmoni holds the largest share of that market. That position is directly tied to its exempt status, according to legal documents filed by rivals.

And that market advantage means big business for the company.

Americans consume more than 250,000 metric tons of garlic a year, about three-quarters of which is produced domestically, mostly in California's Central Valley, where the root vegetable has become a huge source of income. The domestic garlic crop brought in nearly $280 million dollars last year, most of it from four large California producers.

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http://labusinessjournal.com/news/2016/apr/11/competitors-raise-stink-over-garlic/

TWO GARLIC CLOVES

One day two garlic cloves, who were best friends, were walking together down the street. They stepped off the curb and a speeding car came around the corner and ran one of them over. The uninjured garlic clove called 911 and helped his injured friend as best he was able. The injured garlic clove was taken to emergency at the hospital and rushed into surgery. After a long and agonizing wait, the doctor finally appeared. He told the uninjured garlic clove, "I have good news, and I have bad news. The good news is that your friend is going to pull through." "The bad news is that he's going to be a vegetable for the rest of his life".

source: Garlic Jokes - Vegetable Jokes

THE BENEFITS OF ONIONS AND GARLIC:

Nature's Weapons against Cancer

By Ty Bollinger

BENEFITS OF ONIONS AND GARLIC

You might not like the smell of onions and garlic on your breath, but you might want to reconsider your dining options. One of the major benefits of onions and garlic is that they (and their allium cousins: shallots, scallions, and leeks) provide serious cancer prevention and fighting power.

Packed with allicin, sulfuric compounds, manganese, vitamin B6, vitamin C, copper, and selenium to name a few, garlic and other allium vegetables are incredibly nutrient-dense but naturally low in calories. They stimulate your body's production of glutathione (the most potent antioxidant for your liver) which boosts detoxification throughout your entire system.

THE SCIENCE OF FOOD MEDICINE

According to studies conducted by Italian researchers, people who have a diet rich in onions and garlic have a significantly lower risk of developing certain cancers. In a comparison of many Swiss and Italian studies, they compared the relationship between consumption of allium herbs and the development of cancer cells.

An increased daily consumption of onions, garlic, and other allium species like chives and leeks significantly reduced the chances of cancer cells developing in the mouth, larynx, esophagus, colon, breast, ovary, and kidneys.

A moderate consumption of onions was found to lower the risk of laryngeal, colorectal, and ovarian cancers. Its anti-cancer effects are notably greater when more onions were consumed. As for garlic, a moderate consumption has been associated with lowering the chances of developing colorectal and renal cell cancers. People who ate more of this herb have been found to have a decreased risk of contracting all cancers.

Due to the fact that breast and prostate cancers are primarily hormonal and reproductive in nature, the allium family does not have as big of an impact on them.

The sulfur compounds that give these vegetables their characteristic odor and flavor are integral in constructing connective tissues such as ligaments, tendons, and cartilage.

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https://thetruthaboutcancer.com/benefits-onions-garlic-natures-weapons-cancer-2/

I was arguing with a friend in Pizza Hut the other day when my best mate came over, grabbed the garlic bread and coleslaw from our table and ran off. I wish he would stop taking sides.

GROWING GARLIC

FROM BULBILS

By Paul Pospisil

Growing garlic from bulbils, the small round bulbs found in the scapes or stems of garlic, is generating new interest. The practice was brought to Canada by European immigrants, according to anecdotal evidence. By planting bulbils, growers can rejuvenate garlic strains and have a back-up source of garlic in case the bulbs die or become infected with disease.

Some growers use bulbils to develop a supply of planting stock at very low cost and to avoid the transmission of soilborne diseases.

Usually, garlic is reproduced vegetatively by planting cloves from the underground bulb. Vegetative reproduction is sometimes referred to as cloning. The cloves are planted, generally in the fall, and each clove produces a bulb the following summer. Garlic also reproduces from bulbils produced in the scape (topset) of hardneck garlic or along the false stem of softneck. Bulbils are tiny, undivided bulbs that can be used as seed. Garlic does not have fertile flowers so it does not produce a true seed.

Garlic 101:

Bulb (head): the underground, rounded organ of vegetative reproduction in plants, such as the tulip, onion and garlic, containing the stored food for the reproductive shoot inside. The garlic bulb is divided into segments called cloves.

Bulbil: a small, round secondary clove, which can be smaller than a grain of rice or as large as a chickpea, produced in the scape of hardneck garlic or along the false stem of softneck.

Clove: a segment of a bulb of garlic. In standard garlic cultivation, cloves are separated and planted individually.

Head: another name for a garlic bulb.

Round: small undivided bulbs that often result from planted bulbils.

Scape: a flowerstalk that emerges from hardneck garlic. Unless the grower is saving bulbils, scapes are usually removed and either eaten or composted.

Bulbil capsule of the Purple Stripe Czech Broadleaf garlic.

Successive replanting of the progeny from the bulbils produces a strain superior to that produced from the cloves of the original mother plant.

Bulbils vary in size and appearance. In Porcelain garlic, for example, there may be up to 150 tiny, grain-size bulbils in a single capsule. On the other hand, Rocamboles may have only four bulbils, each the size of the fingernail on your little finger. The length of time to grow a full-size bulb varies considerably between varietal groups (see pg. 20)

Ted Maczka, the Fish Lake Garlic Man, showed that successive replanting of the progeny from the bulbils produces a strain superior to that produced from the cloves of the original mother plant. Our own early trials at Beaver Pond Estates support these findings. We initiated a long-term trial in 1999 to determine whether or not improved garlic strains can be developed through bulbil propagation.

Beaver Pond Estates Bulbil Project

In the first year, bulbils were allowed to mature on the plant and collected. They were planted in the fall around the same time as garlic bulbs, and harvested

the following summer. The second cycle was started with rounds (i.e. bulbs from the harvest of the planted bulbils), again planting in the fall. Bulbils were planted 1 inch deep, rounds at 2 inches and cloves at 4 inches.

Successive cycles used the rounds or bulbs, whichever the strain produced, for replanting. In each cycle, the best samples were selected for planting. A control sample of the same strain was grown using cloves from the mother plant.

Plants grown from bulbils had less tip yellowing, suggesting less disease in the plant, compared to plants grown from cloves. Generally, the larger bulbils from the Rocamboles produced larger rounds in the first year than did the tiny bulbils from Porcelains or Siberians. Not all bulbil-grown plants produced larger bulbs than clove-grown ones. As well, replicating the process with a new set of bulbils did not necessarily produce the same results.

Conclusions cannot be made from a single experiment of growing a full-size bulb from a bulbil. Sound data is based on

Bulbil capsule of the Turban Artichoke, specifically Lucian's Sicilian garlic.

Growing garlic from bulbils

Varietal group*	Sub-variety	Example of strain tested	No. of bulbils per stem or capsule	Years to grow full-size bulb	Remarks
Porcelain		Majestic	100–150	4–5	Produces rounds the first and second year; rounds or small, divided garlic the third year.
Rocambole		French	4–9	2–3	May produce either rounds or small bulbs the first year.
Purple Stripe		Czech Broadleaf	3–6	1–3	Large bulbils have produced 2-inch bulbs in first year, but usually do so in 2–3 years.
Purple Stripe	Marbled	Siberian	100–150	4–5	Some Marbled garlic appear identical to Porcelains.
Purple Stripe	Glazed	Purple Glazer Red Rezan	10–50	3–5	Inconclusive results.
Artichoke	Standard	Endurance F4 Italian	1–5	2–3	About ¼ to ½ of plants develop stem bulbils. When planted, these tend to produce large rounds the first year.
Artichoke	Asiatic	Pyong Vang Sakura	3–10	Unknown	Weak bolting. Initial trials inconclusive.
Artichoke	Turban	Chinese Purple Xian	4–100 (?)	Unknown	Weak bolting. Initial trials inconclusive.
Silverskin		F40	variable	Unknown	Occasional stem bulbils, some years develop topsets or scapes.
Silverskin	Creole	Native Creole	5–30	Unknown	Inconclusive data.

*For details on varietal groups, see www.gourmetgarlicgardens.com/overview.htm.

Bulbil capsule of the Porcelain Majestic garlic.

repeating the experiment numerous times. It was also obvious that help was needed if the information was to be gained during my lifetime. More data need to be collected from different regions and that data presented in a practical and usable form. I appealed to growers across Canada for help by means of the Bulbil Project (see box below.) I am still looking for more participants from some regions.

I send packages of bulbils to participants along with instructions for growing and recording. Project growers are asked to keep basic records (e.g. dates, quantities, sizes and/or weights, and observations).

Other bulbil projects

I'm pleased that growers across Canada are becoming interested in this advanced growing method. Sonia Stairs and Henry Caron of Boundary Garlic are now promoting and selling bulbils as part of their annual offering of garlic planting stock.

The Garlic Growers Association of Ontario has been struggling with the problem of disease in their Music strain of garlic since devastating commercial crop losses in 1987 and 1988. According to Becky Hughes of New Liskeard Agricultural Research Station, losses from virus-infected garlic are estimated to be between 25–50%. A government-funded program to produce clean seed was initiated using the tissue culture method and a bulbil growing trial.

How to grow garlic from bulbils

If you are going to collect bulbils, do not remove the scape. Let it mature on the plant until after the harvest of the other bulbs (i.e. those with scapes removed). This takes an extra week or two. You will likely forfeit the underground bulb, as it will be much smaller.

Carefully take the capsule from the scape and remove the bulbils from it. Store in a dry place until planting time.

Plant bulbils at the same time as you plant garlic (October in our region). Bulbils are planted 1-inch deep about 2 inches apart. You may plant directly in the garden

Cloves of the Asiatic garlic.

The Bulbil Project ...

... at the Small-Plot Garlic Variety Trials, Beaver Pond Estates, Maberly, Ontario

The bulbil project needs your help!

Will you help? Growers and gardeners, especially home gardeners, are invited to participate. A grower from each province or growing zone is needed.

Purpose: To grow garlic by the bulbil method in as many regions and soil conditions across Canada as possible to validate the utility of this growing technique in maintaining a strong, healthy stock of garlic for planting.

What do you need to do? Plant different types of garlic bulbils. Harvest, weigh and measure the first year's crop, and replant. Continue with this until you have full-size bulbs (i.e. at least two inches in diameter).

Each year, record the planting and the harvest, as well as any growing observations. Growing instructions and record forms are provided. Your information will be consolidated with other reports into a database that can be used by growers. I will provide a set of five bulbil strains to start or you may use bulbils from your own garlic. The bulbils are free but I ask for a small contribution to help pay the mailing costs. Any garlic you grow from this project is yours to keep. If you already grow from bulbils, your information would be appreciated.

—Paul Pospisil, Editor, The Garlic News*, 3656 Bolingbroke Rd., Maberly, Ontario K0H 2B0, garlic@rideau.net*

but you risk infecting the new garlic with soilborne disease and losing the first-year plants among the weeds. It's preferable to plant in containers filled with sterilized soil or potting mix. Bury these in the garden, slightly above the soil surface. Plant at least ten bulbils of each type. Mulch with straw. Next spring, weed and water the plants as you would with regular garlic.

Harvest the plants the following summer about the same time as garlic bulbs. Clean and cure the tiny crop. Some will have grown 'rounds,' small, undivided bulbs, while others may form a divided bulb in the first year. Plant your best ten cloves or rounds. Rounds and tiny cloves are planted two inches deep. Containers with sterilized soil are recommended. By the second or third harvest, you should be getting fairly good-sized bulbs, depending on the variety. I've had stubborn Porcelains refuse to grow anything but small rounds for four years before finally agreeing to form a divided bulb.

Mary Lou bundling scapes for market. Unless you plan to collect bulbils, scapes are usually removed to enable bulbs to grow bigger. The scapes are a seasonal garlic delicacy.

When you are in your last planting cycle, select some clove-grown bulbs (same strain) of the same size and weight and grow alongside the bulbil-grown ones. Both should be planted in the garden rather than in containers. Compare disease indications, size and colour of plant, and, following harvest, bulb size.

Good luck with your bulbil planting experiments. They will start you on the way to learning more about this most fascinating of vegetables.

Paul Pospisil, Master Gardener Emeritus, is an organic gardener. He and his wife Mary Lou run their farm, Beaver Pond Estates, near Maberly, Ontario. They conduct growing trials on garlic and publish The Garlic News, *the only Canadian quarterly dedicated to the growing and use of garlic.*

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Cooking With Garlic

Pages 23-26

HONEY GARLIC CHICKEN

The pungent—and delicious—garlic in this dish could help protect your prostate.

by Toby Amidor, M.S., R.D. http://tobyamidornutrition.com/

A 2013 study published in the Asian Pacific Journal of Cancer Prevention associated garlic with a decreased risk of prostate cancer. It is thought that garlic's potent smell is how it works its cancer-fighting magic. • Researchers suspect that the sulfur in garlic is activated when chopped, and that smell is released. It's these compounds, they believe, that may help destroy prostate cancer cells. More research is needed, but it's just another reason to toss more garlic cloves in to dishes.

NUTRITION (PER SERVING)

Calories: 323; total fat: 4g; saturated fat: 0g; protein: 31g; carbohydrates: 42g; fiber: 1g; cholesterol: 157mg; sodium: 287mg. MAKES 4 SERVINGS

Prep time: 15 min. Cook time: 20 min.

INGREDIENTS

1 lb boneless, skinless chicken breasts, cut into bite-size pieces
2 eggs
1/2 cup brown rice flour or whole wheat panko bread crumbs

FOR THE SAUCE:

1/2 cup honey
5 cloves fresh garlic (minced)
2 Tbsp low-sodium soy sauce
1 Tbsp brown rice flour
Optional: 1 Tbsp sesame seeds

HOW TO MAKE IT

After cutting chicken into bite-size pieces, dip in small bowl with eggs, then roll in small bowl with brown rice flour/panko bread crumbs. (Salt and pepper are optional.)

Place on nonstick baking dish in preheated oven (400°) for about 15 minutes (until golden brown).

While chicken is baking, make sauce over stove on medium-high heat by combining honey, garlic, and Braggs Aminos into saucepan. In a small bowl, mix together 1 Tbsp of brown rice flour and 1/4 cup water. Add to saucepan, and continue to mix all ingredients together until thickened.

Add chicken to saucepan to coat each piece evenly. Remove from heat, and add optional sesame seeds. The chicken pairs great with brown rice and broccoli.

https://www.eleatnutrition.com/recipes/2014/12/17/honey-garlic-chicken?rq=HONEY%20GARLIC%20CHICKEN

How did the hipster burn his mouth? *He ate garlic bread long before it was cool.*

How do you make garlic toast? *Lift your glass and talk about the wonderful things it has done.*

Crunchy Apple Garlic Cake

Pat Reppert, Mad for Garlic (Quixote Press, 1997) (Reprinted with permission) Desserts

INGREDIENTS

3 tablespoons softened butter
1 cup sugar
1 egg
1/2 teaspoon ground cinnamon
1/2 teaspoon ground nutmeg
1/2 teaspoon salt
1 teaspoon baking soda
1 cup sifted flour
1 teaspoon vanilla
3 cups peeled and diced apples
4 cloves garlic, put through press
1/2 cup chopped walnuts
whipped cream with sugar and crystallized ginger for topping

METHOD

Using an electric mixer, beat the softened butter, sugar and egg for about 3 minutes.

Meanwhile, sift together the cinnamon, nutmeg, salt, baking soda and flour, then add the flour mixture to the butter/egg mixture and continue beating for 1 to 2 more minutes, adding the vanilla during the last minute.

Put the apples in a separate bowl and toss with the garlic puree, evenly distributing the garlic among the apples.

Stir the garlic-seasoned apples into the cake batter along with the walnuts. The batter will be fairly stiff, so use a spoon and stir to mix well.

Using a spatula, spread the batter in a well-greased and floured 8" x 8" x 2" pan. The size of the pan is important to the final texture of the cake.

Bake in a 350 degree oven for 45 minutes. Time it-it's impossible to tell when it's done by using a toothpick.

Serve with whipped cream seasoned with a bit of sugar and snippets of crystallized ginger.

Two Unusual Garlic Recipes For Garlic Lovers

These days you find information everywhere on the health benefits of garlic. We all know about using garlic in Italian recipes or yummies like hummus, guacamole or salsa. I like garlic – but only if it's been cooked because the raw pod ain't for wussies! Still, if you're a garlic-crazed person like my son, here are two unusual recipes to consider.

DR. OZ'S GARLIC TEA

Dr. Oz is such a garlic fan that he recommends garlic tea and his recipe calls for 8 cloves of garlic. Simmer them for 10 minutes in two cups of water, then strain out the garlic and add 2 T of lemon juice (which is potent in its own right, if it's straight from the lemon and not perfidy like Realemon). Add honey to taste.

CHOCOLATE-COVERED GARLIC CLOVES

Eleanor Roosevelt Ate 3 Chocolate-Covered Garlic Cloves Every Day. Believe it or not, I'm not that crazy about chocolate so this recipe doesn't do it for me. But if you'd like to try it, here it is:

- Bring 3 T of cream to a simmer
- Add 3 T of unsalted butter
- Add 4 ounces of 60% bittersweet chocolate and stir until smooth
- Remove from heat and mix in 2 cloves of minced garlic
- Allow the chocolate to cool and refrigerate until firm
- Roll into 15 balls and toss in cocoa powder or coconut

This chocolate covered garlic will keep in the refrigerator for two weeks.

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https://www.blissplan.com/health/two-unusual-garlic-recipes-for-garlic-lovers/

Spicy Shrimp with Garlic, Basil, & Rosemary

"Goddess of Garlic" **Pat Reppert** of Saugerties, New York, shares this recipe from her cookbook "Mad for Garlic." Source: Martha Stewart Living, July 2002

INGREDIENTS

Salt and pepper
1 pound penne pasta
1 tablespoon plus 1/4 cup extra-virgin olive oil
8 garlic cloves, cut into matchsticks, plus 1 more for pressing
1 tablespoon finely snipped fresh rosemary leaves
1 large onion, thinly sliced
Yellow Onions

1 pound large shrimp, peeled
2 jalapeno chiles, seeded and finely diced
1/2 red bell pepper, seeded and cut into strips
1 yellow bell pepper, seeded and cut into strips
1/2 cup thinly sliced basil leaves, plus whole leaves for garnish
1 tablespoon tamari sauce
2 teaspoons Worcestershire sauce
2 tablespoons medium sherry
2 teaspoons sugar
1/3 cup pitted and halved black olives

DIRECTIONS

1. Bring a large pot of water to a rapid boil; add salt. Add pasta, and cook according to package directions until al dente. Drain, and return pasta to the pot with 1 tablespoon olive oil and 1 garlic clove put through a garlic press. Stir to combine. Keep warm.
2. In a large skillet, heat remaining 4 tablespoons olive oil until hot but not smoking. Add garlic matchsticks, and cook until golden, stirring constantly. Add rosemary, and cook for 1 minute. Remove garlic and rosemary from the skillet; set aside. Add onion, and cook, stirring, until golden.
3. Add shrimp and jalapenos to the infused oil, and cook, stirring, until shrimp are just done. Add peppers, basil, salt, and pepper, and cook until the peppers are cooked, yet still crisp. Make a well in the center of the skillet, and add tamari sauce, Worcestershire sauce, sherry, and sugar. Stir to dissolve sugar. Return garlic and rosemary to the skillet. Add olives, and cook until heated through, 1 to 2 minutes, stirring occasionally.
4. Serve shrimp and peppers over the warm penne. Garnish with sprigs of basil. Serve immediately.

Martha Stewart - Spicy Garlic Shrimp w Pat Reppert https://www.youtube.com/watch?v=8SkONH43P5o

THE SCIENCE OF SLICING GARLIC AND ONIONS

Garlic and onion slicing is a matter of chemistry and technique. Don't miss these tips on how to maximise their flavour to their full potential.

by Riccardo Meggiato / September 15, 2017

Garlic and onions are the essential ingredients of many dishes. Some chefs prefer to do without them, knowing that they have a very strong flavour and tend to mask all the other ingredients. But this is as always a matter of method and quantity: garlic and onions, in fact, are a concentrate of substances which if correctly used can positively enhance the flavour of the other ingredients.

Let us start from the basics: we often speak of garlic and onion together because they are considered to be similar. And that is indeed the case: both in fact belong to the amaryllidaceae family. Their chemical and culinary characteristics are therefore very similar. Each of them, technically, do not have aroma; that is to say, they do not contain odorous substances.

HOW TO SLICE GARLIC

The inside of each garlic clove is called the "germ" which is also the youngest part of the bulb and therefore rich in the substances that give this vegetable its typical flavor. In fact, the outer part of the garlic is actually the oldest, which, with the passage of time, loses its aromat-

THE SCIENCE OF SLICING GARLIC AND ONIONS continued

ic intensity. Instead, the germ, which is "the last born", tends to be much more aromatic. If the odor and the taste of garlic are too strong, removing germs makes the flavour less intense and more delicate.

I imagine that this news will astonish you, but the odour of garlic in fact depends on a reaction caused by slicing. When we slice garlic an aminoacid is released which is rich in sulphur and immediately comes into contact with an enzyme called alliinase. So the two create allicin: this is the substance that gives the garlic the odour and taste for which it is used.

From this we derive an important lesson: the more we cut off a slice, the more we encourage the reaction between aminoacid and enzyme, increasing the production of odours and flavours. Not only that: the slicing 'only' allows the reaction to happen, but the reaction then continues with the passage of time. Therefore, to sum up, the more we cut a slice and the more we expect to use the sliced garlic, the stronger the odour and taste will be.

Therefore if we are to put a mere trace of garlic in our dish, it is better to cut one slice in half and use it straight away. If however we want as much intensity of flavour as is possible and imaginable, we cut the slice into tiny pieces and wait for about 10 minutes before using the chopped ingredients. But we should bear in mind that once the garlic starts to cook, the allicin will change into a series of compounds with a more delicate aroma.

HOW TO SLICE AN ONION

You will not be surprised to learn that much the same description applies to the onion. In this case too we are faced with a vegetable without aromas, since these form only after the onion is sliced. Obviously there is always an aminoacid on a sulphuric base, very similar to allicin, beneath the phenomenon. The aminoacid, after the onion is sliced, always comes into contact with the enzyme alliinase, forming the compounds that give the onion its characteristic aroma and taste. Furthermore, the enzyme LF-synthase forms propanethial S-oxide, the substance that causes tears.

It goes without saying that the same identical advice concerning garlic applies equally to the onion. With one more thing. Various studies have shown us in fact that cutting the onion lengthways, that is to say from the top to the bottom instead of across the middle, reduces the intensity of the aroma and also the quantity of tears. Not only that: for both garlic and onion, the use of a food processor tends to intensify the aromas.

GARLIC AND ONION SOUP

To put into practice all that we have learnt, all that remains is to try an easy and delicious recipe. This is the fabulous garlic and onion soup. Slice two large onions and cut up about ten cloves of garlic into small pieces. Sauté the garlic and onions in plenty of oil for about 10 minutes, then add a glass of white wine, soften the mixture and add a litre of vegetable stock. Bring to the boil and simmer on a low flame for 40 minutes. Turn off the heat and leave the soup to cool for 15 minutes, then add 150 ml of fresh cream, stir it into the soup and serve it with slices of toast.

Obviously you now know how to increase or decrease the intensity of the taste of garlic and onion!

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https://www.finedininglovers.com/stories/how-to-slice-garlic-onion/

DOCTORS OFFICE

A guy walks into the doctor's office. A banana stuck in one of his ears, a garlic clove in the other ear, and a carrot stuck in one nostril. The man says, "Doc, this is terrible. What's wrong with me?" The doctor says, "Well, first of all, you need to eat more sensibly."

MATH MISTAKE

After a minor mathematical error on a routine report, a worker's boss tried to belittle him in front of his peers. Angrily she asked, "If you had 4 garlic cloves and I asked for one, how many would you have left?" Quickly he replied, "If it was you who asked, I'd still have 4 garlic cloves."

source: Garlic Jokes - Vegetable Jokes

BATTLING THE BUGS WITHIN

Eating raw garlic may help combat the sickness-causing bugs that get loose inside our bodies. Garlic has been used internally as a folk remedy for years, but now the plant is being put to the test scientifically for such uses. So far, its grades are quite good as researchers pit it against a variety of bacteria.

For eons, herbalists loaded soups and other foods with garlic and placed garlic compresses on people's chests to provide relief from colds and chest congestion. Now the Mayo Clinic has stated, "preliminary reports suggest that garlic may reduce the severity of upper respiratory tract infection." The findings have not yet passed the scrutiny of numerous, large, well-designed human studies, so current results are classified as "unclear."

A solution of raw garlic and water may stop wounds from becoming infected.

Can a garlic clove help stop your sniffles? A study published in the July/August 2001 issue of Advances in Therapy examined the stinking rose's ability to fight the common cold. The study involved 146 volunteers divided into two groups. One group took a garlic supplement for 12 weeks during the winter months, while the other group received a placebo. The group that received garlic had significantly fewer colds -- and the colds that they did get went away faster -- than the placebo group.

Garlic also may help rid the intestinal tract of Giardia lamblia, a parasite that commonly lives in stream water and causes giardiasis, an infection of the small intestine. Hikers and campers run the risk of this infection whenever they drink untreated stream or lake water.

Herbalists prescribe a solution of one or more crushed garlic cloves stirred into one-third of a cup of water taken three times a day to eradicate Giardia. If you're fighting giardiasis, be sure to consult your health-care provider, because it's a nasty infection, and ask if you can try garlic as part of your treatment.

Finally, in the January 2005 issue of Antimicrobial Agents and Chemotherapy, researchers reported the results of an investigation into whether fresh garlic extract would inhibit C. albicans, a cause of yeast infections. The extract was very effective in the first hour of exposure to C. albicans, but the effectiveness decreased during the 48-hour period it was measured. However, traditional antifungal medications also have the same declining effectiveness as time passes.

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https://home.howstuffworks.com/garlic10.htm

THE CHEMICAL WEAPONS OF ONIONS AND GARLIC

by Harold McGee / June 8, 2010

WHAT do garlic and onions have in common with gunpowder? A lot. They're incendiary. They can do harm and they delight. Sulfur is central to their powers. And they helped inspire the work of a chemist who has just published a welcome treatise on the smelly yet indispensable allium family.

Eric Block became hooked on chemistry by way of basement and driveway pyrotechnics while growing up in Forest Hills, Queens. By high school he had become the science nerd while his schoolmates Paul Simon and Art Garfunkel were the epitome of cool. He found his calling in allium chemistry as a new Ph.D., and over four decades has worked out many of its details at the State University at Albany.

Dr. Block's book "Garlic and Other Alliums: The Lore and the Science" was published earlier this year by the Royal Society of Chemistry. The chemical details are tough for a nonspecialist to follow, but much of the text is in happily clear English. It includes a wide range of cultural references and beautifully reproduced images, among them excerpts from Sumerian cuneiform tablets and "Dracula" and pictures of the firework-like flower heads of ornamental alliums, the onion domes of Russian churches and Antonio Gaudí's garlic-topped Barcelona apartment house.

Dr. Block also carefully evaluates the mixed evidence for allium efficacy in folk and modern medicine, and explicates the chemistry and treatment of garlic breath. (It can emanate from deep within for a day and more; raw kiwi, eggplant, mushrooms or parsley can help.)

Most helpfully for the cook, he sorts out the different kinds of allium flavors and how they evolve on the cutting board and stove. And he gives an intriguing preview of new alliums just over the horizon.

"It's still astounding to me what happens when you cut or bite into an onion or a garlic clove," Dr. Block told me in a telephone conversation last month. "These plants originated in a very tough neighborhood, in Central Asia north of Afghanistan, and they evolved some serious chemical weapons to defend themselves."

Their sulfur-based defense systems give the alliums their distinctive flavors. The plants deploy them when their tissues are breached by biting, crushing or cutting. The chemicals are highly irritating, and discourage most creatures from coming back for seconds. They kill microbes and repel insects, and they damage the red blood cells of dogs and cats. Never feed a pet onions or garlic in any form.

Any cook knows that chopping alliums releases chemicals that sting. Garlic can get into the eyes and mouth even if a clove is just rubbed on the foot, a body length away. Its active ingredient passes right through the skin and into the blood. Prolonged contact with garlic will blister and burn the skin, as some of the book's less pleasant photos document.

Dr. Block explains that different alliums stockpile different sulfur chemicals to make their weapons, and this accounts for their varying flavors. The stockpiles themselves are inert, but when the plant's tissues are damaged, enzymes in the tissues quickly convert the sulfur compounds into reactive, stinging molecules.

Garlic cloves produce a chemical called allicin, which is responsible for their strong pungency and aroma. It's a relatively large molecule and acts mainly on direct contact with the eater, the plant world's version of hand-to-hand combat.

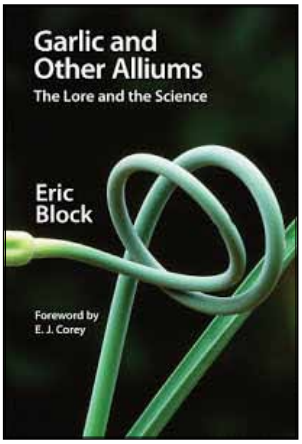
The flat-leafed allium known as Chinese or garlic chives produces a small amount of garlicky allicin,

but much more of a different weapon that has a milder, cabbage-like aroma.

Onions, shallots, scallions and leeks share a special stockpiled chemical and a second defensive enzyme. They produce a sulfur molecule that's small and light enough to launch itself from the damaged tissue, fly through the air and attack our eyes and nasal passages. This long-distance weapon is called the lachrymatory factor because it makes people's eyes water.

"The lachrymatory factor is extremely potent," Dr. Block said. "Only tiny amounts get anywhere near your face when you cut onions, but it's still enough to make you tear up. When I smelled the pure compound it was overwhelmingly painful, like being punched in the eye socket."

Other familiar alliums, like elephant garlic, ordinary chives, wild ramps and ramson, generate variable mixtures of the garlic, Chinese chive and onion weapons, and have a blend of their flavors.



The same reactivity that makes the allium sulfur compounds such potent weapons also makes them short-lived. They immediately begin to react with other molecules in the plant tissue and gradually generate a flavor that is less pungent but also less fresh-smelling, more harshly sulfurous. The heat of cooking speeds these and other reactions, largely eliminates the pungency, and allows the sweetness of the alliums to emerge and blend with the sulfurous aromas. Heat also knocks out the tissue enzymes, so they can't produce any more pungency.

This basic chemistry leads to some general guidelines for cooking.

If you're using onions or garlic or chives raw, in a dressing or salsa, either chop them just before serving or rinse the chopped pieces thoroughly. Water removes the harsh aging sulfur compounds from the cut surfaces, so you'll taste only the fresh ones.

If you're heating garlic or onions or their relatives, then cooking whole or coarsely chopped bulbs will moderate their flavor. Crushing or grating will intensify it.

Crushing can also diversify the flavors that alliums contribute to cooked dishes. They're valuable ingredients in part because their sulfur chemistry suggests and reinforces savory meat flavors. Last year a German study of meat stews found that by far the strongest contributor to the overall "gravy" aroma was an unusual sulfur compound that came not from the meat, but from the onions and leeks. And that compound appears only after these vegetables have been cut up.

So if you're counting on alliums to give depth to stews or braises or stocks, then chop them finely or crush or purée them. Heat will eliminate the bite and develop the aroma.

Dr. Block's book may be the definitive word on the alliums for the moment, but as it and he make clear, there are new flavors to look forward to.

Researchers in New Zealand and Japan recently developed an experimental onion that lacks the lachrymatory-factor enzyme. So it's tear-free, but unlike very mild onions like Vidalias, it still has its full stockpile of sulfur materials. It ends up boosting the levels of trace compounds that Dr. Block discovered and named zwiebelanes. He describes them as having "a wonderful, fresh, sweet onion aroma." So this tear-free onion promises to be intensely oniony, but in a new way.

Dr. Block and some of his colleagues are also beginning to study the several hundred allium species that still grow wild in Central and Southwest Asia, a number of which are harvested locally and eaten in large amounts, and have very different defensive chemistries. "I want to see what other surprises nature has in store for us," he said.

But flavor exploration begins at home. "There's a lot going on under your nose while you chop and cook," he told me. "Use your nose, follow the changes, and you'll discover new and delicious things."

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https://www.nytimes.com/2010/06/09/dining/09curious.html

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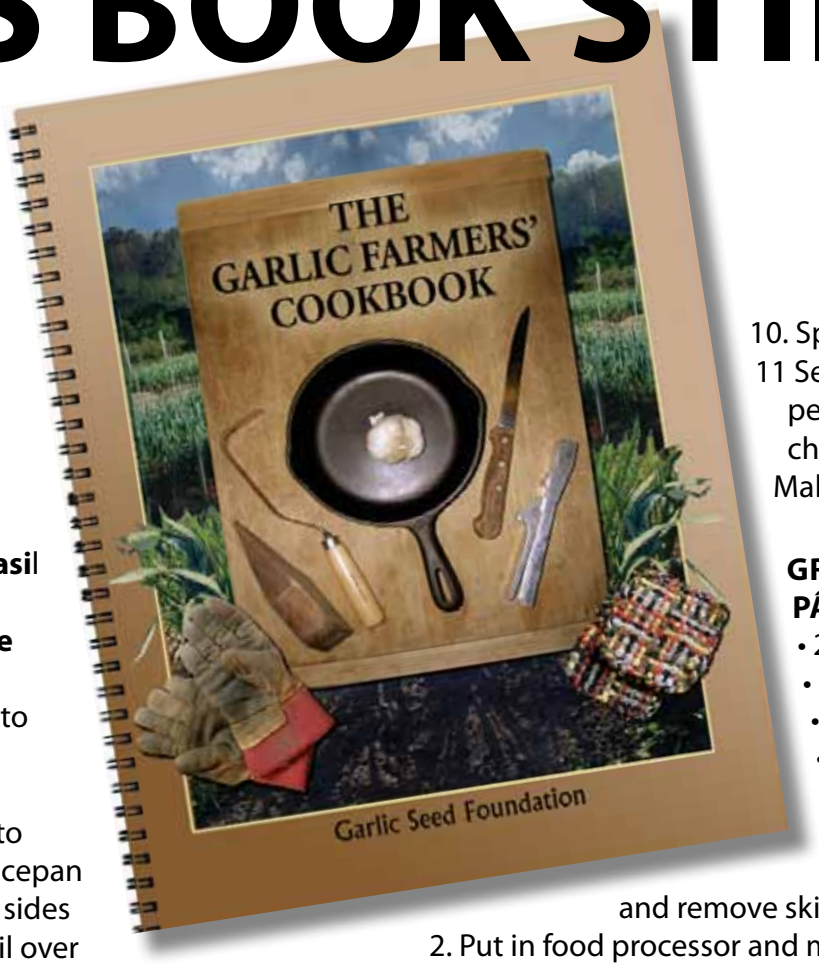

CARROTS WITH GARLIC AND BASIL

- 1 pound **carrots**
- 2 teaspoons **olive oi**l
- 1 to 2 cloves **garlic**, minced
- 1/4 cup minced fresh **basi**l or 1 teaspoon dried
- 1 teaspoon **lemon juice**
- Ground **pepper**

1. Peel carrots and cut into sticks or diagonal slices
2. Pour enough water into large heavy pot or saucepan to reach 1 inch up the sides
3. Cover and bring to boil over high heat
4. Place carrots in large steamer basket over boiling water
5. Cover and steam until tender, 4 to 5 minutes
6. Remove carrots from basket and pat dry (make sure that they are dry or they will splatter when placed in hot oil)
7. Heat oil in large nonstick frying pan over medium-high heat
8. Add carrots, garlic, basil and lemon juice
9. Sauté until cooked through and fragrant, about 3 minutes
10. Sprinkle with pepper
11. Serve at room temperature or very slightly chilled

Makes 4 servings

GREEK GODMOTHER'S PÂTÉ

- 2 cups **almonds**
- 6 to 8 cloves **garlic**
- Juice from 2 **lemons**
- 1/4 cup **olive oil**
- 1/4 cup **semolina or cream of wheat**

1. Blanch almonds and remove skins (see Note)
2. Put in food processor and make into paste (or pound in a mortar and pestle)
3. Remove to bowl
4. Mince or crush garlic and add almonds
5. Add lemon juice and olive oil
6. Cook semolina with water until it thickens to medium paste and cut into almond mixture

NOTE: To blanch almonds, put them in boiling water for about 1 minute, pour out water and remove skins which will slide off.

Makes 4 to 6 servings

WHO EATS **PÂTÉ**????

SEE PAGE 32 FOR GREAT DEALS ON COOKBOOK

GSF MEMBERSHIP

This past spring we started to update and clean up our membership list, and do the same for our mailing list, which will soon be computerized. This will mean cheaper and faster service for us Luddites who still use the USPS and read on paper. We sent out 500+ postcards and I made several hundred landline phone calls, talking to many folks and receiving dues, donations, support, and sad news.

Thank you for your support and kind words. Thanks for sharing your frustration. We've been frustrated for years, unsure of what to do. What we heard loud and clear over and over: you appreciate what we're doing and here's $30 to keep the GSF and the Garlic Press alive. We thank you for that, but we need more than money. Newsletters don't just happen. They need folks like you to contribute.

For the past 10 years, we've been requesting submissions for the Garlic Press, either original or stolen (with recognition of the source), **to share ideas or problems, biographies, history or letters, information that taught, clarified or stimulated your juices.** What about some techno-garlic website reviews from some of you chicken-fingered computer nerd geeks? Garlic blog? What about some humor? Drama? Real news.

Garlic has many stories to tell, but we are poor fisher people: no one takes the bait. Newsletters don't just happen. They need people to create them. The message to us is that you like what we've been doing, but... you're too busy, can't type, have no ideas, aren't funny, the dog ate the pencil! We hear you, but we've been thinking of a few choices: instead of calling it a "newsletter" (once a year), we'll rename it a "yearbook" with a format more as a journal, a personalized journal. We also have a wonderful friend across our northern border who publishes a wonderful newsletter: Paul Pospisil and his Garlic News, a quarterly he's been publishing for 56 issues. You've been reading some of his work, as we've stolen stuff from each other for years. Maybe we could find a way around the tariffs, ignore that they're all going to become pot-heads, and find some type of bi-partisan compromise to work closer together.

Or maybe you've got a better idea? Here's ours: We're on a quarterly schedule. We could have seven regional contributors focusing on their specific production issues with growing it; historians teaching us about its 5000 year legacy; cooks explaining flavors, prep tricks, and delicious ways of eating it; university folks helping us with production guidelines and practices; pathologists helping us with diseases and keeping it healthy; Extension folks conducting research on it; medical folks helping us keep ourselves healthy; economists educating us on the best way to sell it, botanists on its botany and chemists on its chemistry.

We could have a culture department with art, poems, drama, lots of cartoon and jokes, debates on the important issues of mulching, tools, fertilization, etc., and lots of "letters to the editor" (to keep Bob Dunkel busy). No fake-news or on-line bullshit. **While you've got your thinking cap on:** what does this Foundation do for you? What would you like it to do? If you'd like to say something, we'd like to listen.

-- David Stern and Bob Dunkel

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