

This is a SPECIAL ISSUE of *The Garlic Press*

dedicated to Paul Pospisil and selections from the *The Garlic News* coming out of Canada. We have chosen universal articles reflecting best thoughts and practices from early issues. Paul passed away last September (see OBIT)...we continue his work, our work as we share the best of the Canadian press.

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

The Garlic Press

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Paul, known as the garlic guru of Eastern Ontario, and Mary Lou are founders of the Perth Garlic Festival

TRIBUTE TO PAUL POSPISIL

I would practice my very poor French pronunciation (only to make it worse), then I would dial his number. "Bone-jar, bone-jar, Mr. Paul Pospisil..bone-jar..." Dead air...then, "You sound like a dead frog!" A big laugh, some comment about living south of the border, and using the Queen's English!

In all the years of our friendship, I cannot remember a conversation with Paul that wasn't upbeat, humorous, serious, and personal, touching on life, love, problems, victories, yesterdays, tomorrows, and all about the garlic.

I've made four trips to our Canadian neighbors: first was to the Royal Canadian Expo in Toronto to talk about garlic production (first time garlic was on their agenda). The next northern adventure was a grower-to-grower weekend with Ontario - New York growers looking at fields, machinery and talking about mulch, varieties, marketing, etc. It was at this gathering when Al Music and I, after drinking too many bottles of their national beverage, discovered that when a garlic clove was dropped from 32" it would always land on the basal plate (root end). Trip



THE GARLIC NEWS

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TRIBUTE TO PAUL POSPISIL continued

number 3 was to the Ontario Hort-Crops Conference in 1996 when Phil Simon (University of Wisconsin) and I lectured at Cornell University, then drove north to repeat in Toronto. At this meeting I met Paul Pospisil and Ted Maczka (wearing a large garlic on his head) for the first time. The conference organizers scheduled us for an afternoon, but we still had 150 folks there at 9pm when they pulled the plug on us. My last drive north was to visit Paul and Mary Lou at their beautiful home and farmstead in Maberly (80 km north of Kingston) in Eastern Ontario. I went to talk about our research, the GSF, and to celebrate at a local garlic festival. It was while sharing a meal at their kitchen table that I got to know and appreciate what wonderful people Paul and Mary Lou were, and their ideas for the future.

I don't understand what causes a man to catch on fire, but Paul had an intense quest for knowledge: to read, to ask, to research; he wanted it all. This takes time, energy, dedication and a good memory. And once he learned it, it was his to share, and he became a teacher. When you add enthusiasm to this mix, we call it "Preaching the garlic gospel." That was Paul; that was Ted Maczka (whom we knew as the Fish Lake Garlic Man), and that is me, Bob Dunkel, and many of you. Preachers use the spoken word and the written Bible; that's what you're holding in your hands.

Paul started publishing in 2002, which evolved into the Garlic News in 2004. Paul's message was loud and clear: make it CANADIAN, sell it LOCAL, grow it ORGANIC, and it will be good! Every issue opened the door to knowledge, research, bad jokes, questions and answers, recipes, etc. It grabbed onto the problems of leek moth and bloat nematodes and laid out the organic options and solutions. In our small world of garlic there is one basic rule: share what you know/ no secrets/ we want everyone to be successful. Now you may just assume that this is the way it is, or should be, but don't. That does not hold for all types of agriculture. Paul added his simple style, appreciative of people's ideas and contributions, respectful of concerns and questions, and thankful to be sharing his Garlic News. He was a great promoter of the Garlic Festival to attract the consumer, educate, eat, celebrate, add some competition, and create a market and appreciation for local organic farmers.

Paul came from a small farm, spent his career in the Canadian Armed Forces and retired / returned to the land in 1979 with his wife and farming partner Mary Lou. They built their "piece of heaven" to share with their children and grandchildren, but as their garlic work progressed into variety trials, new equipment, production experiments and techniques, they opened their farm, and arms, to the local organic garlic community.

Each of us who walk down this garlic road will tell you how much they love the plant and the taste of the stinky stuff, and their appreciation of

the friendship of the folks who grow it. I am proud to have known and worked with Paul for 25 years, watching that fire help so many of his brothers and sisters without any compensation except for the satisfaction of their appreciation. There was no

man more dedicated to organic principles and our mandate to care for Mother Earth, to which he has returned. His candle burned bright in the minds and hearts of his friends and readers. In my best "dead frog" accent, I sadly say "au revoir." --DS.com



THE FRIENDS OF GARLIC VERSION 2020

It is hard for me to believe that once again a new decade has arrived for the GSF or The Friends of Garlic VERSION 2020

Without getting too redundant, we started in the Eighties of a bygone century when The Green Revolution version 1 had failed and already a tired and worn agriculture trying to feed the world had planted fence row to fence row, taken out the hedgerows and stripped clean the rivers' sides and had buried the small farmers of our country. Big Ag was hooking up with the Big Chemical companies as Big Pharm was already buying up the small seed companies and funding the land grant colleges to pave their way by sidelining folk wisdom, alternative medical choices and the idea of the connection between all of us and the soil and the bounty of the planet. WE were naive enough to think we could change that pattern by reminding folks of what we had forgotten, of folks like Helen and Scott Nearing and the back to the land movements that had preceded us and that maybe just maybe by getting folks together, exchanging ideas having pot luck dinners and visiting one another, farms and gardens we could revive a culture that AGRI-culture seemed to be forgetting. Folks still read newspapers, listened to NPR, went to Grange halls and had meetings and discussions and some fun too....

Yes those days are gone now and sadly a lot of our old friends also but always somehow we have slowly and surely kept moving forward and finding new members and new connections. The nineties brought on the garlic festivals which have grown and grown again across the country and in Canada while the media with new tools of video and the Internet took us into another world that promised more and more

and left many with less and less. It is a different culture now and in some ways the Big Guys have won. They battle on TV sets and cell phones for attention as distraction. They have stolen our children and their children from playing in the woods and staring at real clouds and chasing dreams while coming home dirty with smiles on their faces and a feeling that they were a part of it all.

Now we are consumers to be led into consumption for profits of companies that have gobbled up the mom and pop stores and coops and the pleasures that came with good seed catalogs. It is not even a WHY anymore as if we could rewind and repose in the past but a sheer realization that "they" have made us into generations of consumers that want it all and want it NOW. The wisdom of seasonal foods and canning and fermenting and seed saving is just a click away IF you can get the search engines to still find it and you Re- member to look.....

Enough grumbling. It is what it has become BUT the same choices are here to be stewards of the land and to be kind. To know that soils support us and poisoning the waters and the skies does not. Agriculture is not a chemistry set and soil is not just a dead medium to adjust pH. WE have had years of learning that the way paved forward is not our way and not the way to sustainability. One of our plans is to open up our past issues on our website to be there for our members to read about our roots and the voices of growers around the country that used to actually write to us when we would ask them to tell us how

to grow garlic in..... parts of the country we could not drive to. After we stopped being The Garlic Seed Foundation of New York State we thought chapters across the country would work but members are often not organizers and slowly although our numbers have not changed we have lost the thread that connected us BUT not completely. We probably should be covering and making tribute to our new members and listening to the new young farmers but they are less and less like the family farms. Technology offers the new and with it comes its view but not from me or you? We need your help folks to keep on keeping on and to somehow still keep relevant. It has been a slap to us all to have a world full of half truths fake news photo shopped imagery and now even synthetic foods. Time to get real is it not? The tried is still true if it works and if it "ain't broke why fix it? Yes I know that world is gone and they build things to break so we buy more but this earth and these woodlands, grasslands, mountains, and plains are ecosystems to be saved and protected while we still can...

Forgive my long windedness and just take a small bit of your time to think of your place in this crazy world and remember there still are dreams to be made true for you. This issue of *The Garlic Press* is dedicated to a fellow that has done all of these things and who has made a difference in his life and for many many others in Canada as well as in our country. In the following pages of tribute we take his words and his thoughts, his answers to questions about garlic and give them to you. Paul Pospisil was an editor as well as an enterpreneur of Beaver Pond Estates in Mabury

Ontario Canada....where the rubber hit the dirt road and innumerable trials of hundreds of varieties and methods were tested to all help in making his neighbors and country competitive in growing garlic... From the web:

*Thirty years ago, as a retirement project, Paul and Mary Lou Pospisil turned a 17-acre bush lot in the SW corner of Lanark County into a small farm called Beaver Pond Estates. Their quarter-acre garden is surrounded by lovely perennial gardens, shrubs and fruit trees, and features many cultivars of organic seed garlic. Paul, known as the garlic guru of Eastern Ontario, and Mary Lou are founders of the Perth Garlic Festival. Among their garlic-related activities are research trials (over 200 cultivars have been trialed to date), an annual garlic grower's field day, and garlic consultations and workshops for new growers. To encourage garlic growing of garlic in Canada, Paul & Mary Lou also publish *The Garlic News*, providing garlic information as well as a growers' networking forum.*

I never made it up to Canada to visit but our director David Stern did and you will see his comments in this issue, but we emailed and exchanged issues as editors and I admired Paul for the things he accomplished that we wished we had like active chapters that reported regularly on their research and work. They were a couple and it took the best of both of them to make their lives a success. Much thanks and much love to them both and to you folks that still take the time to read with us! We thank all of you for being part of our family. *-Robert Dunkel*

The Harvest & Post Harvest Handling of Garlic

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*David Stern,
Rose Valley Farm, Rose, NY
Editor: This excerpt is taken from a talk given by David Stern in March 2013 to a group of organic farmers and gardeners in Maine. The talk covered numerous aspects of organic garlic production but this portion of the talk is appropriate to the harvesting period.*

THE HARVEST: After June 21 you can stop cultivating. If growers pull one garlic bulb every week between June 22 and harvest, they will see the bulb

double in size each week for four weeks. If garlic is left in the ground longer, it will eventually grow out of its skin, and the bulb will bust open. Harvest garlic when you start to see a gap right around the stalk, the second or third week in July. Most of us are digging on the early side to ease cleaning. If you have good, intact leaves, it's much easier to clean by pulling back the outside leaf. "Softnecks are normally dug the first or second week of July but the only way to tell if it's ready is to dig one, cut it in half and put it in spaghetti sauce!" Noth-

ing above the ground, e.g., one-third of the leaves turning brown, will tell you when to harvest, said Stern, as drought, disease and other factors like cultivation damage can affect above-ground growth. If you have been irrigating, stop two weeks before harvest. Garlic can be dug with a fork, under cutter, potato digger, root digger, middle buster, mold-board plow or other equipment. If the crop was mulched, harvest methods are limited, because mulching material gets caught on the edges of bed lifters, and the resistance makes the bed lifter climb and cut the garlic in half.

If you use a potato digger, David Stern recommends sewing burlap to the chain so that the garlic doesn't fall through. He strongly recommends setting up simple plywood tables in the field. There's no other time you're going to lift garlic and have a chance to look at it. After a row is lifted, put the garlic in bushel baskets, put it on the table and grade it. If roots are brown, weak and not vigorous, cull that bulb. Cull anything that is diseased, damaged or irregular. Save any large, beautiful bulbs for seed stock for the following year. He says, "Sell everything in the middle." All garlic for seed stock at Rose Valley Farm is hung from barn rafters. Garlic can be washed so that it's clean for market, as long as it's kept in the sun on racks in high tunnels. The internal temperature of the garlic must be kept below 121 F to prevent the physiological process called waxy breakdown, which causes cloves to turn from white to yellow. Garlic kept at 120F or below will be fine.

Crystal Stewart, Regional Vegetable Specialist at Cornell University is looking at six post-harvest treatments and combinations of treatments:

- Trimming roots flush with the basal plate while the garlic was still moist.
- Trimming tops to 6 inches long with a sickle-bar mower in the field.
- Washing with a garden hose and nozzle (not a power washer).
- Curing in a high tunnel under shade cloth and with ventilation fans.
- Curing in an open-air structure without supplemental heat.
- Leaving roots and tops un-cut during curing.

Results from the first year showed that garlic in

high tunnels dried an average of three days faster than in open-air structures, and no tunnel-dried garlic showed damage from that treatment. Also, garlic dried in high tunnels had tighter, less discolored wrappers at one site. Trimming tops in the field enabled a speedier harvest and reduced space taken up and moisture in the drying area, but bulbs with cut tops weighed slightly less – enough to make a difference of \$1,600 over 10,000 bulbs sold at \$8 per pound. However, losing 20 percent of that crop to Botrytis due to poor storage would cause greater losses.

Washed bulbs looked very good at first but became more discolored than unwashed garlic during drying and curing – and had slightly more disease. After hosing it needs to be dried well; he said they would look at washing again next year. This study will continue for another year. He showed a rough design for a tulip-garlic bulb dryer. Garlic is put in bushel crates on a pallet, and the sides of the setup are wrapped in plastic. A fan blows air in through the bottom pallet, and another fan blows air across the top of the crates, drying the crop in two days. This could be a portable set-up, moved from farm to farm. In humid, wet summers, a little heat could be added to help drying. For short-term storage, he recommends hanging garlic in barns.

Long-term storage is very hard. Garlic needs to cure and then be kept at a constant temperature of 32 F and constant relative humidity of 65 percent. Small, unmarketable bulbs can be planted 8 inches apart in a furrow in the fall. In spring, each clove will send up green shoots. Once they're 8 to 10 inches above the ground, cut them off with a sharp knife and sell two or three bulbs worth of garlic greens in late April for about \$1.25. They make a great addition to sauces. The greens grow back and can be cut again two weeks later and a third time after that. David calls this "selling the oink." By the fourth harvest, the greens are too woody to use. Likewise, small cloves can be put in a trench, about 1 inch apart, without worrying about the orientation, spacing or fertilizing, to grow garlic scallions. These are easy to clean with a high-pressure stream of water. The Canadians looked at mechanical removal of scapes. When they tried, they also removed leaves. Loss of one leaf reduced yields by 17 percent; loss of two leaves resulted in a 33 percent loss.

SOME THOUGHTS ON CURING THE GARLIC HARVEST

July has arrived and the garlic is ready to pull. The biggest job of growing garlic is about to begin. While home gardeners find little difficulty handling their own crop, market gardeners face a much larger problem, that of reducing the workload and either getting it to market as quickly as possible or well cured for late year sales. Canadian grown garlic cannot compete with the imports on price; it can only attract buyers based on higher quality.

Harvest is when the grower controls quality of the crop. There is an on going debate on just how best to carry out the harvest. Numerous opinions are offered on the method. There are likely as many opinions as there are growers and there is hardly a single, best answer. These are just some of the important considerations:

- Curing or drying?
- Cut the tops before harvest to make it easier to get them out of the ground or leave them on?
- Clean the mud off the bulbs before or after curing?
- How to remove dried mud from the bulbs?
- Timing and method of removing roots and tops?
- Best curing method and facility?
- Hang the garlic or cure it on racks?
- Are fans needed for more airflow?
- Is supplementary heat needed?
- And, the debate goes on, and on and on.

Garlic is usually pulled before it is fully mature, while it still has a few green leaves remaining to provide for the required bulb wrappers. That means that it will continue to senesce or move nutrients from the leaves to finish the bulbs even after it is out of the ground. "Curing" is the process of allowing the bulb to finish using the nutrients from the leaves. "Drying" is when the green stems have been cut off and the bulbs are simply dried from their immature state, with the stem cut off and the process of senescing stopped. While using a hay mower to cut off the tops may look like a timesaving shortcut, it is at best a poor farm practice, as the garlic doesn't get a chance to finish growing. Curing is a better practice than drying when harvesting for quality.

Mud is the grower's enemy. Growers fortunate enough to have sandy loam for their garlic patch have a much easier harvest cleaning task. Clay soils give the greatest problem. If the clay is allowed to dry on the bulbs and in the roots during curing, the cleaning problem is multiplied. Growers faced with clay soils should always consider washing the clay from the bulbs and roots before moving the garlic to cure. Washing doesn't mean soaking the bulbs; it means cleaning off the soil with a firm spray of clean water.

Removing roots and tops: These are separate activities that are best done at different times. Roots should be cut off as soon as the garlic is pulled to make cleaning easier. Tops are cut off a couple of weeks later after the garlic is cured. In the early years of the garlic trials, we followed the bad practice of pulling the garlic and immediately hanging it to cure. When it was ready, the roots and tops were cut and the laborious process of trying to get the mud off the bulbs and the soil out of the roots started, taking endless hours to prepare it for sale or storage. It took seemingly forever to peel the tight, partial leaves off the bulb and try to brush or shake the dried soil from the roots. After all this work, the bulbs were still never completely free of dirt. In search of an easier method, we looked into pre-cleaning as a time saver. The method that we evolved was: "pull garlic – 1st spray wash of bulbs – cut off roots to ¼" – peel off dead or dying leaves – 2nd spray to wash residual soil from roots and leaves – sort, bundle & hang to cure". Eureka! It worked. Not only did the whole process save over ½ of the harvesting time needed, the garlic was ready for market as soon as it was hung to cure. Buyers were willing to take the clean garlic, stems and all, and even finish the curing process themselves. To a commercial grower, such a saving is huge dollars.

Curing can be done either by hanging or on racks. It makes little difference either way. Curing should be done in a room or building that can be closed off from night dampness. Good airflow to remove moisture speeds up the process so using fans is

recommended. If relative humidity is running high (most years, it runs at nearly 100% in our area in July and August), a dehumidifier is very useful. As well as removing moisture from the air, it has a secondary benefit of adding heat to the curing room. Finally, remember that the harvest is by far the most important task in the grower's schedule.

Rushing the harvest or following poor shortcut practices can ruin a fine stand of garlic. Getting the best possible quality garlic, and obviously, the best market price, is achieved by assigning enough time to do it right. Quality is of the essence.

- Editor. Paul Pospisil

IMPROVING YOUR PLANTING STOCK

FOR THE BEST GARLIC CROP

Methods for conducting garlic trials suitable for small gardens were provided in past issues of the Garlic News. In this article I will outline some techniques for improving planting stock to achieve better crop yields from garlic. The methods used are the same as those applicable to other farm and garden crops, with a little twist applicable to garlic only. Recommended methods are as follows:

- Selection
- Evaluation of new cultivars
- Disease reduction.
- Developing seed by the bulbil method.

Selection is a tried and true method familiar to all growers. Simply, you save your own seed by selecting the most suitable garlic from your current crop to use in planting next year's crop. 'Most suitable' encompasses many aspects; eliminating cultivars that just don't produce well in your growing conditions, even after several years of trying to get them to adapt; replacing them with more productive ones; marking the healthiest and strongest looking plants during the growing season and saving the bulbs from these; at the same time, marking or rogueing plants with obvious signs of disease, those that are yellowed, stunted or otherwise showing symptoms to ensure that you do not replant them; post harvest, when the crop is cured, there are further steps in inspecting the preselected seed— culling out any bulbs with harvest damage, checking roots for decay, a common sign of disease, smelling the bulbs for hidden decay not otherwise visible, and, selecting the most appropriate bulb sizes. Avoid the popular myth of using the largest

bulbs for planting stock, as it is unlikely to be 'the most appropriate size'. For market gardeners, it can be a costly mistake.

Good selection is the starting point for crop improvement. Evaluation of new cultivars has the potential for the greatest crop yield improvement in any field or garden. With over 700 cultivars in 10 or 11 widely differing Horticultural Groups being grown world wide, a grower has more choice than one could ever hope to grow in a lifetime. That is not to discourage trying out new types.

Organic growing is all about diversity and until a gardener tries something different, the opportunity of improving the garlic crop is being missed. The answer lies in growing at least one cultivar from each of the main Groups – Asiatics, Artichokes, Creoles, Porcelains, Purple Stripes, especially the Marbled types, Rocamboles, Silverskins and Turbans. To start with, choose any cultivar in each Group. After growing it for at least 3 years, try another one from the same Group for comparison. Once you're happy with one or the other, keep the best one and diligently select and save your own seed from it for replanting. Do this for all the Groups. You should aim for growing a reasonable number of different kinds, between 5 and 10, if possible. A simple method for comparison of cultivars is found in Issue 44 of the Garlic News.(available online). A diversified crop will offer numerous advantages to any grower.

Garlic is subject to scores of fungal, bacterial and viral plant diseases, most of which cause partial

or catastrophic crop failure. Many diseases are transmitted by infected seed garlic but other serious ones are soil borne, requiring attention to soil health. Diseased bulbs do not produce good crops and dirty garlic can carry diseases in the dirt. Disease reduction in garlic is the result of following good farm and garden practice. Strong, healthy plants are better equipped to resist infection from disease pathogens than plants that are under stress. Organic growers using generous applications of compost and practicing plot rotation carry out two of the best techniques available for growing healthier plants in rich, clean soil. Compost restores soil balance as well as keeping plants strong and healthy, while crop rotation enables disease pathogens to die off in the intervening years when the garlic host is absent. It is well to remember that monoculture promotes the multiplication of diseases in crop fields while variety diversification has the opposite effect. And, unique to garlic, growing from bulbils is a tried and true method of disease reduction, being a good technique for restoring the vigour of garlic planting stock. Some bulbils should be started every year to provide a regular future supply of cleaner seed garlic.

Developing cleaner planting stock by the bulbil method is a low cost, easy method well within the capability and resources of any gardener. All that is required is to save the bulbils from a few plants and plant them in a clean soil. For growers wanting to increase the number of cultivars, bulbils can be purchased from many growers of seed garlic. Bulbil growing instructions are available on request from the Garlic News or found on the Internet by searching under "Growing Garlic From Bulbils" an article published in the Canadian Organic Grower magazine.

-Editor. Paul Pospisil



Gayle M. Volk and Kate E. Rotindo

ABSTRACT OF ARTICLE PUBLISHED IN HORT SCIENCE, VOL 39(3) JUNE 2004

Garlic bulbs (*Allium sativum* L.) harvested in the summer are often stored at room temperature between the time of harvest and curing and either consumption or planting in the fall. The quality of these bulbs usually deteriorates dramatically by 6 months after harvest. Garlic bulbs were placed at -3, 0, or 5 deg C for approximately 6 months to determine if bulbs could be maintained for spring planting. Response to cold-storage conditions was cultivar dependent. We found that most cured garlic bulbs stored at -3 deg C for 6 months successfully formed cloves within bulbs when planted in the following spring. Unlike the high-quality bulbs

formed after -3 deg C storage, bulbs stored at 0 deg C for 6 months often formed side cloves and had loose wrappers. In another study, garlic bulbs stored at 0, 5, 15, or 23 C exhibited a higher rate of shoot elongation within the cloves during storage than bulbs stored at -3 deg C. After 9 months of -3 deg C storage, bulbs then held at room temperature retained the quality characteristics of freshly harvested garlic (firmness, taste) for at least 2 months. These studies suggest that cured garlic can be spring planted and consumed year-round when bulbs are stored at -3 deg C.

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THE CHALLENGE OF FUNGAL DISEASES IN GARLIC

Garlic is subject to numerous diseases that cause reduced yields, and in extreme cases, complete loss of the crop. Most garlic diseases are soil borne, that is, they exist in the soil. The soil has millions of different microbes that include both good and bad fungi. Pathogenic fungi and nematodes cause diseases while beneficial fungi work to destroy the hazardous ones.

There are many disease fungi; the ubiquitous fusarium basal rot and basal plate rot of garlic bulbs; botrytis; the feared white rot disease that can infect fields for up to 40 years; damping off, downy mildew, purple blotch, etc. and more. *The Compendium of Onion and Garlic Diseases* describes 60 diseases affecting garlic and onions, 40 of which are caused by fungi. Quite evidently, most garlic diseases and crop losses are caused by fungi. Fungal diseases are increasingly spreading throughout garlic growing areas. As the industry grows and expands, they are being multiplied by a combination of infected seed garlic along with poor farming practice. Weather has an impact as well. The wet, damp spring and summer weather that we experienced in the past several years have also provided favourable conditions for some of them to thrive. Is there a solution to this problem? First, there is no instant solution, no seed treatment or soil soak, no silver bullet that will make the problem go away. The “bad fungi” are a part of nature and exist in soils the world over. There are also the good ones, the ones that fight and destroy the bad ones, reducing damage to plants. This fact points to the ways and means to manage and control fungal diseases and prevent catastrophic crop losses. This is where organics comes in. The organic farmer is in a good position to manage and control soil-borne diseases and their spread, having an arsenal of effective tools. It’s all in using good practices.

Although not an all-inclusive list, the most important organic practices in the control of fungal diseases are:

- Disease control starts with the soil. This is where the damage occurs and this is where the solution is to be found. Developing and maintaining healthy organic soil is essential in growing healthy plants. Healthy soil teeming with beneficial microbes grows strong plants that resist disease better than the weaker plants grown in marginal soil. Healthy plants produce chemicals that reduce or prevent the infection by the fungus. The plants produce their own disease fighting drugs.
- Using compost improves soil health. Does compost reduce diseases? Not directly. Compost is not like a drug taken to fight a sickness. You don’t add compost and suddenly see a plant get better. Compost changes the number and type of microbes, multiplying the beneficial organisms a thousand-fold. These microbes will in turn destroy the diseases. Mycorrhizal fungi included with the compost produce anti-biotics that protect against pathogens and improve garlic yields.
- Compost tea makes the benefits of compost go farther. Sprayed on the leaves, it helps suppress foliar diseases. Poured on the soil around the base

of plants, the good microbes out-compete the disease-causing microbes. Make the tea aerobically, using a bubbler.

- Crop rotation enables disease pathogens to die off in the absence of host plants. For example, fusarium rot of garlic will be eliminated from the soil when the hosts, garlic and onions are absent for 4 to 5 years.

- Selecting and saving your own planting stock avoids importing more diseases.

- Discard diseased cloves to avoid planting them. Some growers even go to the extent of peeling all the cloves to check for disease symptoms.

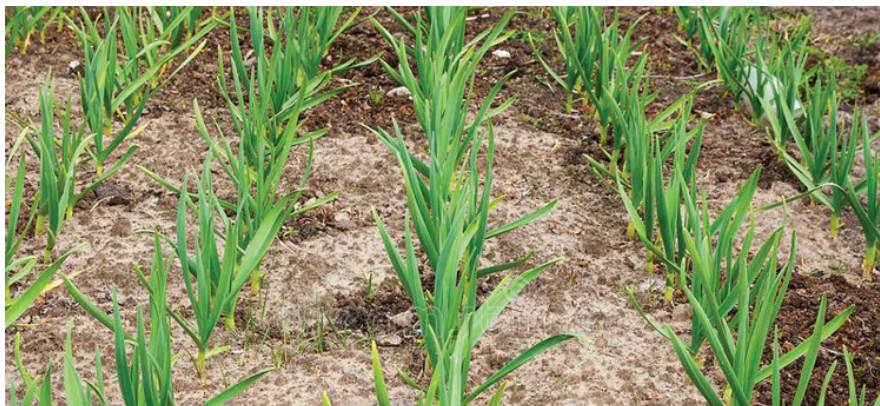
- Hot water treatment of cloves before planting destroys hazardous fungi. Although not 100% effective, this treatment helps to reduce disease in the cloves.
- Rejuvenate garlic planting stock on a regular basis using the bulbil planting method.

- Selectively use cover crops to clean up soil pathogens.

There are more good practices. Follow as many as possible in all phases of the garlic growing cycle. The science of soil borne plant diseases is still a frontier science. Questions on what goes on and in organic soil and what are the interactions between the millions of microbes and their action on plants remain unanswered.

What is known is that organic practices do improve and maintain soil life and that this good soil produces healthy plants. It is evident that diseases are unlikely to ever be eradicated. However, growers can successfully deal with this challenge by diligent organic practice. The result is healthier garlic and considerably reduced crop losses.

-Editor. Paul Pospisil



FLASHBACK TO FALL 2015 CROP

By Al Picketts

Garlic seed sales for the fall of 2015 were good but, with such a beautiful crop, there was more seed-quality garlic resting comfortably in the freezers than ever before. I had three large chest freezers full to the lid and more hanging in the garlic room. If you are having trouble storing your garlic due to shrinking, sprouting, moulding or rotting, you might want to consider buying a temperature controller and a chest freezer in which to store your garlic. It's probably a good idea to line the freezer with something to hold the bulbs away from the really cold walls of the freezer. I use a metallic bubble wrap. I have no idea how long it can be held at -2deg C but if I were to hazard a guess it would be measured in years. Maybe this year I will be able to put my theory to the test. Other years I sold out of garlic by late June or early July. The garlic coming out of the freezers at that time was still just as pristine as when it went into the freezer in late October. When this garlic is removed from the freezer it can be used for anything with which you would normally use fresh garlic. It can be sold for fresh eating garlic or made into dehydrated garlic products such as chips, pearls, sand or powder. I use it to make my yummy black garlic. I sell it for planting and plant it myself. It grows beautifully.

Each year I grow more Marino than the previous year. For those not familiar with Marino let me say this about that. Marino is a Rocamboles type of garlic with about eight cloves per bulb but it differs from other Rocamboles somewhat. Marino wakes up in the spring after all the other garlic varieties

are up and growing but not as late as the Jumbo Elephant. Not to worry. Marino will grow well with hardly a miss in the row. It seems to be not only winter hardy but also rather resistant to fungal infections, which can be a real problem with other garlic varieties, especially Rocamboles. The bulbs can be quite large if given half a chance with good fertility and plenty of sun and room to grow. Marino harvests later than the other Rocamboles too. This comes in handy when you are rushed to get other garlic varieties harvested before they get too mature. While varieties like French Rocamboles, Italian Purple, Alison's, Killarney Red, Korean Purple and others are screaming at you to bring them home, the Marino is quietly waiting its turn without objecting to being harvested last.

I started growing Marino in 2002 from a little handful of bulbils that I had bought from The Garlic Store in Colorado. Those few bulbils have multiplied into lots of seed sales, lots of eating garlic, lots of top quality black garlic, a large freezer full of beautiful seed-quality garlic and enough for my nephew and I to plant 17,000 cloves last fall. Marino has done everything I could ever ask it to do. The reports I get back from those who have planted Marino have all been positive. That makes me happy. I can see Marino becoming the primary garlic variety in Canada some day. If you haven't tried it you owe it to yourself to give it a go and see what it will do for you. My guess is that it will do plenty. Oh, did I mention that Marino looks very pretty? Well, it does.

LOW-TEMPERATURE STORAGE OF GARLIC FOR SPRING PLANTING

Keeping harvested garlic over the winter, or suitable storage is a problem that plagues both home and market gardeners. Some garlic varieties have a very short storage life of less than 6 months while most can deteriorate quickly when stored under the wrong conditions.

Dr. Gayle Volk, one of the top researchers in the USA, has investigated this issue. For growers with Internet access, just search by title and Dr. Volk's name. The report can be read as published in the

scientific journal. An abstract of the research paper follows this article.

You can try it for yourself. Basically, all you need is a small chest freezer, an accurate thermostat, some wiring and a bit of know-how. This year, I will be doing a short experiment myself to determine just how any grower can adapt this system to their own use.

- Editor. Paul Pospisil.

PAUL POSPISIL

THE GARLIC GURU

Readers of this paper may have noted that two weeks ago we published a photo from the Verona Garlic festival that included Paul Pospisil, who attended in order to participate in the handing out the Eastern Ontario Garlic awards, one of the many initiatives that he started up as part of his decades long work as a promoter of home grown garlic. In the article that accompanied the photo, it was noted that many had been surprised to see him since he had been ailing. The article did not get into detail, but Paul was not ailing, he was dying from pancreatic cancer.

A week later, we published his obituary. He died just three days after that photo was taken. The fact that he made it to the Verona Garlic Festival was a testament to his tenacious efforts to promote local agriculture on all levels, from people who grow 100 garlic bulbs a year for personal use, to those who grow 5,000 for sale.

I once attended a garlic summit at Beaver Pond Estates, more as a writer than as a garlic grower, and could tell that Paul took garlic growing pretty seriously, that he was committed to teaching and to trying out different strains to see what can be grown in our local climactic conditions. A lot of his insights were the subject of articles in the Garlic News, which he

published with his wife Mary Lou, and in other materials that were produced over the years.

He was pretty exacting about garlic, so much so that a number of people, including some pretty successful garlic growers, were happy to visit him and ask questions online or over the phone, but did not really want him to visit their garlic patch, for fear that it would not live up to his standards

I also knew Paul as a stalwart volunteer with the Maberly Fair Board. He showed up in our office semi-regularly with posters and flyers to go in the paper. He was not a man who was shy or insecure with his opinions. He was quick witted as well, and all of that makes from someone who is entertaining to talk to, about any topic. We did not agree politically on a lot of issues, and he often shook his head at the editorial stances I took in the paper, but rather than being offended by them I think he just found them amusing.

"I'm sorry about this because I like you, but you couldn't be more wrong about that," I remember him saying. I don't remember the issue that he was talking about but I remember the tone of the conversation. He was lighthearted but uncompromising.

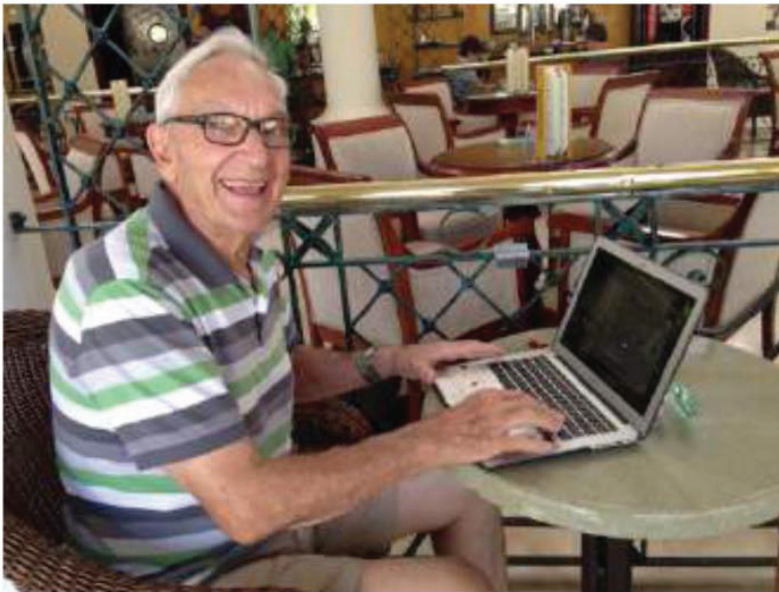
He wasn't that lighthearted when an attempt was made by the Ontario government to tax him for his small maple syrup shack under "commercial industrial" instead of agricultural. He fought that pretty hard and eventually they backed down, certainly over small scale syrup operations like his.

Paul Pospisil was one of the people that make this area an interesting place to live. With his wife, Marylou, he made the most of a beautiful piece of land that does not fit neatly into either the category of agricultural or recreational, and worked with his neighbours and with a national network of lovers of the stinky rose, and participated in community life on his own terms.

We know only aspects of people that we meet, and Paul Pospisil had a vast set of family and community connections that I know nothing about, but even with a few dozen interactions, short conversations really, over 20 or so years, you get an impression, a sense of the person.

Like most of us who live here for long enough, whether we were born here or came later, Paul eventually became what I like to call "local colour".

And there is a bit less colour locally now that he is gone.



NOTES *from our* GARLIC PATCH

Did you know that writing is hard work? Yes, it certainly is! I spent over 180 hours during our vacation at the computer, banging out articles for the Garlic News, working on a presentation and plugging away at a book I was writing. That's over 6 hours a day plus you have to get up every hour or so to stretch the stiff muscles, clear the mind and do some exercise or you risk blood clots in your legs. Now, if you've been outdoors doing gardening or driving a tractor, it may not sound like a big deal, but I challenge you to try it. I'll bet you'll choose weeding the garlic patch any day.

SEEDY SATURDAY IN OTTAWA

Daughter Catherine and I spent our annual outing again at Seedy Saturday sharing a corner space in the Ron Kolbus Centre in Ottawa on March 3. Garlic was featured at our joint stall. I brought my meagre supply of spring planting garlic bulbs and they were snapped up like hotcakes. There are well over 100 similar events across Canada every winter, providing both a seed sale and seed exchange but also encouraging gardeners to save seeds to ensure the future of the world's food supply. The ten largest seed corporations dominate three quarters of the commercial seed market, destroying open pollinated seeds in order to create a dependency of farmers on them for costly new hybrids. The Seedy Saturdays, or in some cases, Seedy Sundays are held in midwinter, just about the time the seed catalogues arrive, and gardeners dream of getting into the garden. Greta Kryger, who has a business growing and selling heirloom seeds has been organizing this Ottawa event for decades.

SPRING PLANTING OF GARLIC IS CATCHING ON

My talk at the Seedy Saturday event was titled

"Spring Planting Garlic in the Ottawa Valley" and if the packed room was an indication, the subject was long overdue. Over 50 avid gardeners were seated and more standing against the back wall. My talk was based on the successes and failures of the spring planting trials that I have carried out. Why should spring planting be of such interest? First, as all gardeners are well aware, the time to plant is in the spring, not in the fall. The sun tells you this. More important, organic growers rotate their garden plots, and it's difficult to do a rotation when planting both spring and fall planted crops. The rush to our garlic stall after the talk was the proof. Gardeners want to plant garlic in the spring!

SPOTTED ON THE INTERNET: BEAVER POND ESTATES

Going to the dentist can have many surprises, not all of which are about your teeth. When we arrived for our semiannual hygiene and dental check, the receptionist said: "I didn't know that you had started the Perth Garlic Festival." She handed me this article and picture that she had copied off from the Lanark Local Flavour website listing local farms in the Lanark County.

WE GET CALLS AND LETTERS

DIP FOR SEED GARLIC?

Cheryl Greisinger of Millarville, asked: We had our wettest year on record this year and drying our garlic has been really tough. Probably conditions closer to what you are used to out east I would imagine. Is there anything you can recommend that has been successful in treating or dipping your garlic into prior to planting? I have heard of hydrogen peroxide solutions that might help in eliminating mold spores prior to planting. Can you please share your thoughts on this? We are planting in about a week and it looks like a lot of our seed could use this treatment.

EDITOR: Hi Cheryl. If your garlic simply has dark spots of black mould on the outside from poor or damp drying conditions, chances are that its only wrapper deep and hasn't affected the flesh of the cloves. Peeling a few cloves should tell you. In this case, surface disinfection with hydrogen peroxide or alcohol could help. I haven't used peroxide but alcohol should be used at mixtures above 50%. Check its strength and don't dilute it any weaker than that. Time of immersion is of little essence. It essentially kills bacteria on contact but doesn't destroy fungi.

Now, if your seed garlic is diseased, that's a much more serious matter. As far as I know, two groups of common garlic diseases are fairly prevalent in Alberta, the fusarium's and some botrytis as well. You can have your garlic checked at a government lab to find out for sure if you have them. Both of these exist in the soil as well as in the garlic itself (soil-borne and seed borne) and both are very destructive to crops. I'm not aware of any good organic dip that works to remove disease carried inside the garlic itself. A dip will merely destroy some of the disease organisms on the surface of the bulb. You would still be planting diseased garlic into infected soil so you'd be no further ahead. If your seed garlic looks bad - peel the cloves on any bulbs that appear soft - the garlic is good if they are firm and clear. If they have diseased areas or are soft and rubbery, set them aside and don't plant them. Diseased seed garlic will not produce a healthy crop. Good organic practice is your best preventive measure in managing disease.

CHERYL AGAIN: Thank you so much for the information. I really appreciate it. I trust my seed stock. I also sent my garlic in for lab testing prior to harvest and it came out clean! That's good news. We had such a wet year and I harvested when they were wet. Many of mine had mold when I pulled them from the ground. We continued to get rain even after harvest, so the drying shed was quite a damp environment. So many conditions that were odd and not at all ideal for garlic curing.

EDITOR: Hi again, Cheryl. Sounds like your planting exceeded your harvesting resources. Remember the basic rule of any farmer or market gardener. It's the harvest that determines how much you plant, not how easy it is to put seed in the ground. Look into building both a harvest cleaning facility and a controlled garlic curing building. Our climate is changing. We went from dry summers to wet about 15 years ago and had to abandon the drive shed as a curing area and move it indoors to keep out the night dampness to prevent the garlic from being destroyed by mould.

BEST SIZE OF SEED FOR PLANTING DAVID WAUGH OF PORT MOODY, BC,

ASKED: This year I planted my 775 Red Russian at an average of .036 lbs. per clove and another 88 at .033 lbs. per clove. Do you know of any study of optimal clove size or is it just too subjective to define?

EDITOR: Hello David. Best size of garlic for planting is a topic of much debate, misinformation and disinformation. Your question, while appearing simple, touches on a number of different aspects. There are so many variables in determining best seed size that a generalized statement covering them all would be erroneous.

Ron Engeland did some work on this at Filaree Farms in the early '90s and its covered in outline in his book. John Zandstra did two years of growing experiments with Music Garlic at Ridgetown College and I believe that his reports are still available on-line. I have tried to get an answer to questions of this nature annually for the past 20+ years in the

cultivar evaluations carried out in the Small-Plot Organic Garlic Variety Trials. The conclusions from these trials give variable results on a year to year basis (weather?) and only broad conclusions can be drawn with respect to best size of seed, based on several years of observation of any cultivar.

It can be said that larger bulbs (which equate to larger cloves) produce larger bulbs in the next crop, but only up to a

point, after which any increase is counterproductive. This point appears to occur at about the Super Jumbo or Colossal bulb size in most cultivars. For hardnecks, the best bulb sizes for planting are between Giant and Extra Jumbo. The cultivar comparisons from my trials are published each year in *The Garlic News*. The arithmetic of calculating crop to seed ratio has been done (it shows up in the column titled "H:S ratio"), as it is relatively easy to do it from the numbers in the summarized records of weights. There are also the differences in number of cloves

per bulb. This varies from region to region with southern regions typically producing bulbs with more cloves (i.e. smaller cloves but more of them) while northern grown bulbs of the same Horticultural Group and cultivar producing fewer but larger cloves. As well, the cloves from a Porcelain are much larger than those from an equal size bulb

from a Rocambole or Purple Stripe cultivar and yet both would appear to produce the same size bulbs when starting with seed bulbs of the same size. I'm not aware of the details of your specific conditions. However, it would appear that your 1/4 lb. bulbs of Red Russian would measure around 2 3/4" diameter or Colossal size, a bit on the high side for bulbs used for planting stock. The slightly smaller ones,

.033 lbs., should in fact give you the better crop. Since your clove weights are averages, there will be significant differences in clove sizes and each size will likely perform differently. Looking at a cross-section of the Rocambole bulb, you'll generally see one fairly large clove, one or two slim ones and the remainder fairly uniform in size. Sometimes, its best to set aside and not plant the large one and the slim ones as these are most likely to give you poor results. Use only the uniform ones. Factors, such as good growing practices, soil nutrients and growing conditions are

more important than the size of the planted clove in determining the size of the crop. You may wish to carry out these comparisons yourself. I've published simplified field trial procedures for growers over the past two years. They are not difficult to do.

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More calls & letters

Early garlic emergence in the fall

Richard Beaudette, Ottawa, ON, asked: I was taking a turn through the garden today, and noticed some garlic up about three inches. On October 17, I planted the Chinook I got from you and promptly forgot about it and all the rest until I would look forward to seeing it poking out of the ground come spring. Imagine my surprise when I saw those lovelies standing up so proudly after less than three weeks! I'm not sure how they will fare over the winter. Have you had any experience like that, and what was the outcome? Is there anything I can do (except maybe a lot of mulch over them) to help ensure their survival?

Editor: Hi Richard. Fall emergence is an occasional but not rare phenomenon. It mostly occurs with Turbans or Asiatics. I hadn't encountered it with the Creoles before but we are into a strange weather year. Early emergence is the breaking of dormancy caused by the cooler temperatures in the fall, a necessary step in the growing cycle. In most cultivars, you don't see that its happened because the garlic has only set roots but hasn't poked the little sprout above ground. To protect the little sprouts from shredding by the November & December winds and blowing ice, you should toss on a little extra straw mulch. The garlic is hardy enough so that it will survive the winter OK. It's the prewinter wind damage that does the harm. Paul

SELLING GARLIC ON THE ORGANIC MARKET

PART 1 WHAT IS OR IS NOT THE ORGANIC MARKET?

Now that you're immersed in organics - the science of soil organisms and their effects on plant health, good and bad fungi, mycorrhizae, the mysteries of crop rotation, which vegetables to follow and which to come first, composting, soil pH, and dozens of other topics - plus, mastering the skills needed to grow garlic organically and properly to achieve top quality, --, well, the next challenge is selling at a profit on the organic market. Saturday farmers' markets will soon open, customers eagerly awaiting the bounty of fresh, locally grown vegetables, and on the summer horizon, a whole series of harvest festivals, garlic festivals and other marketing venues.

The urge to sell hits you, right in the pocketbook. So, what is this organic market, where is it to be found and how can you get your fresh garlic to the buyers? First, eliminate the obvious "NOTs".

- The supermarket is not the organic market, despite the large "organic" section in the produce department. Examine it closely and you'll see that the bulk of the produce is imported, or, shipped long distances. When it comes to garlic, the stuff on the shelves is shoddy and lacking in quality. Retail prices for organic are higher, but generally lower than the cost of growing the same vegetables locally. Besides, if you do the arithmetic, you'll lose money trying to meet the wholesale prices that food chain buyers will pay.

- Wholesale selling is NOT a good option for a market gardener at the best of times. There are exceptions. Yes, specialty food stores, health food shops, ethnic markets and quality restaurants but even they need to buy at wholesale prices to make a

profit. They generally pay more than the food chain or supermarket but still lower than the going local retail price.

- Unless you intend to export or sell across provincial borders, you do NOT have to certify organic to grow organically. You can sell organic but you can NOT promote it as "organic". The Canadian Organic Regulation governs the use of the word "organic", its derivatives and translations essentially for the import/export trade, making it the exclusive domain of businesses certifying as organic. The name doesn't change the taste of your fresh, locally grown product. Your customers will get to know and trust you, provided you earn their trust with honesty and quality.

- Organic garlic is NOT a stand-alone crop. Think about it. If you grow organically, crop rotation is an essential part of your operation. Letting rotation fields go idle is poor farm practice. Growing a non-marketable crop is just poor business. Growing garlic in rotation with a selection of other market vegetables or crops is a normal organic method as well as making sound business sense.

DIRECT MARKETING

Next, the obvious conclusion, having rejected selling wholesale means selling at full retail price, directly to consumers. This is called direct marketing. It has the advantage of being much more profitable. The farmer receives the full retail price for the crop, not the much lower wholesale price paid by the middleman. Two decisions are required for direct selling; a) where to sell, and, b) how to go about the task of selling itself. Personal marketing skills needed to sell to the public are not a usual skill possessed by farmers and gardeners. These are skills that need to be developed. Selling locally, provided the community is large enough, is obvious. Travel is both time consuming and expensive.

FORMS OF DIRECT MARKETING

Local opportunities comprising the organic market generally include the following:

- Farmers' markets.
- Garlic festivals.
- Farm gate sales.
- Co-operatives.
- Community Shared Agriculture (CSAs).

These will be covered in more detail in a following article. Building an organic market garden as a business often starts at the local farmers' market. Look for one now and learn about it even before you are ready to sell your first crop. Then, you can branch out from there. Balancing available time between growing and harvesting the crop and being out selling it at the same time is a juggling act; there is never enough time to do both and do them well. The market gardener needs to be well organized, develop personal skills, both in growing and marketing, and, will still need to get help to do all the tasks and do them well. Any job worth doing is worth doing well, and that takes a lot of work. However, the rewards, both in satisfaction and profit will make it worth it.

PART 2 BUILDING YOUR BUSINESS

from
The Farmers' Market Building Your Market Business

Building an organic farm products business often starts at the local farmers' market. If there is a Garlic Festival in your region, include that event in your planning. A Garlic Festival is simply a big farmers' market that has a central theme of garlic. While the farmers' market may satisfy early-year sales, a long-term goal may be to evolve the business into Farm Gate sales, a Farm Store, a Pick-Your-Own or other form of local sales. However, it will save you a lot of work and money if you decide to launch your business from your stall at the local market. You develop a loyal following at the farmers' market. They will be your core customers when you decide to sell from

your farm instead of trucking goods to the Saturday market.

BUSINESS PLAN

- Every successful business venture starts with a roadmap of how you will get to your profitable business. It's called a Business Plan. A good plan is carried out over several years, five being a realistic period. Resist the urge to find a quick profit. It just isn't that simple. Rome wasn't built in a day and neither can a profitable local farm products & market garden business. Write out the plan in outline.
- Start with marketing. Determine the potential size of the market, or, are there enough potential customers to buy your intended products. Is the farmers' market nearby, are you on a busy road that attracts buyers or, where else could you sell? The Marketing Plan is part of the Business Plan. It is essentially a statement of the products, where they will be sold and a conservative estimate of income from sales.
- Set your goal or targets. When will you start selling and how large an operation would you like to aim for in future? Will you sell vegetables only or do you plan on raising bees, chickens for eggs or other farm products? Will you include canning, baking or other value-added products? These will impact on the resources and facilities needed.
- Prepare an outline of the form and size of farm market operation desired. This is the Production Plan. Again, set targets, e.g. Horticultural target: five acres of land in crop rotation at the end of five years. Establish the amount of acreage to plant in the 5-year buildup, e.g. 1/5 of the land in year one, 2/5 in year 2, continuing to increase each year until the full five acres is in production.
- Prepare a budget and a first estimate of expenses and income. Don't forget the tax man. He'll be knocking on your door sooner than you think, so keep good records.
- Make and prioritize a wish list of equipment and machinery needed for the farm. Check actual costs of machinery purchases from established dealers and include these in your annual budgets.

- Resource Plan: Identify your resources, both those needed and those on hand. Labour availability at harvest time, land acreage, soil quality, water sources, equipment, sources of seed, organic manure and mulch, buildings for harvesting, curing and storage of vegetables, poultry and livestock shelters and a list of essential smaller items.
- Choose your land site and establish your rotation plan. Let us say that your final target calls for five acres; three acres of market crops, one for vegetables, one for garlic, one for legumes, and, two acres for forage and cover crops. Divide your field or garden into five equal, one-acre parts and annually rotate the crops through the five plots on an annual basis.
- Select a preliminary list of crops to grow for sale. Garlic is not a stand-alone crop and should be grown in rotation with other vegetables and crops to maximize profits.
- With a draft plan on paper, plant your first trial crops, then, start the learning process.

PREPARING TO SELL

Once you have an outline Business Plan, prepare for your first selling year. There is a myriad of things to do but first and foremost, are two learning curves:

a. Learning how to grow various crops; and,

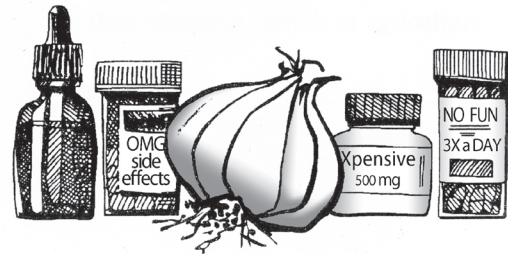
b. Learning how to sell successfully.

Both activities take time, a lot of work, practice and a willingness to learn how to do things well. You'll find that you must budget your time, to fit in all the tasks needed. It's very difficult to be cultivating and harvesting crops, and preparing the produce for market while at the same time, manning a vendor stall at the market. Farming never has been, and to this day is not, an 8 to 5 job. Farmers work long hours, no weekends off and must squeeze in a short vacation when they can hire a caretaker in a quiet period.

FARMERS' MARKET RULES

Every farmers' market has rules and regulations set by the vendors to govern how they conduct their business in order that all will profit. Learn the rules, participate in the running of the market, become a model vendor selling the highest possible quality products and your business will prosper. Good luck with your organic farm business!

-Editor. Paul Pospisil



FOOD IS MEDICINE

Al's Ramblings

SPRING PLANTED GARLIC

By Al Picketts

Have you ever wondered what would happen if you did this or that? Something that you can't find in the book you have about garlic. I wonder all the time. If I can't find it in the book, then I experiment. What I find may not be new to the world but it is new to me and it might be new to you too. One of these subjects is spring planted garlic.

When do you plant your garlic? October? Of course. That's the best time and any garlic grower will tell you that. Well, what happens if you plant your cloves in the spring? I did just that about five years ago and I've planted every spring since. Oh, I still

plant most of my garlic in October but I've spring planted more and more each year. Let me tell you what I've found because all garlic types do not behave as you think they should.

Let's start with Turbans. Now don't shake your heads in disgust. Turbans can be a wonderful garlic. Big too. Here's what I've observed: I planted about 1500 cloves of Turban one spring to get an early jump on fresh garlic sales. Turban is the earliest type to harvest. I thought that planting it in the spring would give me some beautiful bulbs earlier than usual. What I found was, yes, it grew fast and fell over early but when I dug them up, I had

rounds instead of bulbs. For those not familiar with the term, a "round" is a bulb that has not divided into cloves. Yep, just one big clove that is perfectly round. Looks like a marble. Now, some folks might think, "What is the use of this little, good-for-nothing, non-bulb of garlic? Nobody will want it. What a waste." But, hold on there. Don't eat these little rounds. Plant them. They will grow into the biggest bulbs of Turban garlic that you have ever seen. I didn't dig up all the rounds that first year. I left most of them in the ground to see what they would do. Well, they surprised me by growing in October and November so that they had about a foot of greenery by the first snow. "So much for that experiment." I said to myself. "They'll not survive winter." But they did. Next spring, up they came. And what beautiful garlic. Best Turbans I've ever seen. Some almost three inches across but most 2 inches and better. Lovely.

I've done the same with Elephant. Plant cloves in the spring and harvest only rounds in August. And what rounds they are. Some as big as baseballs but all the way down to pingpong ball size. I planted them in October and harvested the biggest Elephant bulbs the next August. Much bigger than fall planted. I was so impressed that last fall I didn't plant any Elephant cloves, only rounds.

This spring, I plan to plant several thousand of Turban and Elephant cloves to have rounds for sale in the fall. I expect the price will be about \$2 for Turban rounds and \$5 for Elephants. I have no idea as to how many rounds I'll sell but if you might want some, be sure to get your order in early. Whatever I don't sell, I'll plant myself. I plant Creoles in the spring too. In fact, I don't plant any Creoles in the fall any more. Haven't for years. They just grow so much better when spring planted. For years, I couldn't get a Creole much bigger than my thumbnail. Now I'm harvesting Creole bulbs up to 2 3/4 inches across. And they look so pretty when the bulb wrappers are removed with their burgundy coloured clove covers. If I ever wore a suit, a nice Creole bulb would look great in the lapel. And Creoles keep so well. They're still in great shape when you're harvesting Turbans the following July.

Last spring, I did an experiment. I figured that Silverskins would not do well if spring planted. They are my last type to harvest and some years that isn't until the first week of September but normally about August 25 – 30. Well, I was certainly surprised. The spring planted Silverskins harvested about the same time as fall planted but the size was even bigger. The shape was also a surprise. Fall planted Silverskins tend to be somewhat football shape. I call it laterally compressed. What you might think a garlic would look like it you were to lay it on its side on the floor and step on it. Laterally compressed. But, the spring planted Silverskins grew very round. No, they didn't grow as rounds – Turbans and Elephants do that. Only the shape of the bulbs was round. And they cleaned up so easily. They were beautiful, round, white bulbs of Silver-skin garlic. I will plant several thousand Silverskins this spring. Rocamboles and Purple Stripe Marbled do well when spring planted. They really respond to early planting, the earlier, the better. I aim for the second half of April but I'm sure southern Ontario and western BC would be able to plant much earlier. It is possible to get spring planted Rocamboles and Purple Stripe Marbled to rival fall planted garlic for size, shape, colour and keeping ability.

I find it difficult to grow a good crop of Porcelains in the spring. Oh yes, they'll grow but just not as large as the fall planted garlic. I suppose you could say that a poor crop from spring planted Porcelains is better than no crop because you missed the fall planting. Oh, yes. Much better. I expect areas where earlier planting is possible could grow great Porcelains. Try it and see.

I haven't spring-planted any Artichokes yet. I'm sure they would do well but I sold out of Artichokes last fall so have none to plant this spring. Seems odd since growers think of Artichokes when they think of spring planting garlic. To sum up I'll just say, "Try spring planting garlic and see what it will do for you." And if you need great seed, I have lots for sale at regular fall prices. Al's Eureka Garlic ad with his contact information is on the facing page. He lists a large assortment of cultivars for spring planting and will have additional ones for the fall.

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To Grow or Not to Grow?

Pépinière Boucher in St-Ambroise QC
Ferme Stéphane Boucher...

Because of their expertise, impressive facilities and one hundred qualified employees, Boucher and Limoges were invited to participate in the Semences Boréail project in 2015, and they soon realized how this type of crop was perfectly suited to their operations, because planting and harvesting times occur when their main operations are slowing down and so they have employees available. The difficulty of finding healthy seeds of garlic ensured that they led their efforts to produce seed from bulbils, starting their first trials with Music in 2015 and expanding to twenty different varieties through 2016 and 2017.

They try different methods of culture: In the greenhouse in cells, trays and bins. In the ground under net, or in open fields in buttes or beds. One million young garlic plants from bulbils. Planting rounds in containers Bulbils under net. At the end of their presentation, Stéphane Boucher announced that the decision was taken to concentrate their efforts on the production of meristem in-vitro starting material by 2018. Asked whether he is referring to Végétolab, he remains vague. Must we understand that he plans to become the third multiplier farm? The mystery still hovers.

Importations Allium Inc.

They nevertheless have recently created a new entity, Importations Allium Inc., the latest division of the Pépinière Boucher group. It was set up to provide producers with the opportunity to stock up on certified garlic seeds from France at very competitive prices. In the fall of 2017 a full container of 13 tons was imported to meet the needs of some 30 Ail Quebec producers. But no one guarantees that we will depend on France forever, warns Boucher who does not appreciate the mechanically inflicted injuries and the presence of Fusarium in the French garlic. With a large smile, Sophie Limoges adds: In a near future we hope this new company will be the distributor of certified seeds produced by us.

Meristem tissue culture

Plant tissue culture is a collection of techniques used to maintain or grow plant cells under sterile conditions. It is widely used to produce clones of a plant in a method known as micropropagation. Meristem culture mainly involves culturing a bud in a culture medium under sterile conditions. A meristem is the tissue in most plants containing meristematic cells, found in zones of the plant where growth can take place. The method is gaining considerable interest in the production of clean seed garlic in an effort to reduce the spread of garlic diseases.

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GARLIC TISSUE CULTURE IN QUEBEC

By: Jean Lafontaine

Ferme Stéphane Boucher & Filles, a division of Pépinière Boucher could become a partner in "Semences Boréail", an innovative clean garlic seed project in Saguenay/Lac St-Jean. The geographical characteristics and the cool climate of Saguenay-Lac-Saint-Jean favour a distinct agriculture associated with its nordicity. For instance, this region produces the most lowbush blueberries, oats, canola and seed potatoes in Quebec. When in 2006 the golden potato nematode crisis hit producers across the country to the point where neighboring countries closed their import borders, only one region was spared: Saguenay-Lac St-Jean. Yet, despite the protection afforded by their geographical enclave, local garlic producers encountered the same problems as most of us. Somehow, they needed to find a source of healthy seeds.

FIRST STEPS

In 2013 -14, inspired by the French expertise and rich with a \$220,000 grant offered by the Regional Economic Development Agency for a project spread over three years, they went into action. Objective: To ensure the production of healthy seed on three local farms to eventually supply the Quebec garlic producers market.

The project started with 2000 certified Music rounds from Guelph University and five farms. Three would be multipliers, Ferme Tournevent in Hébertville, Potager Grandmont in St-Gégéon and Stéphane Boucher. Two other farms constituted the test network. They estimated the need of Quebec producers between 80,000 and 160,000 kg (based on a planting rate of 1,000 kg / ha), and planned to produce 2000 kg in 2015, 5000 kg in 2016 and 20 000 kg in 2017. They called themselves "Semences Boréail".

The realization of the project proved to be more difficult than expected. So, at the end of the third year of the project and the exhaustion of the

budget, there were only two farms left and they had merely managed to market about 1000 kg in the autumn of 2017. Of course, many were quick to conclude that the project was a failure, but they were wrong.

Learning from the difficulties they had encountered, the survivors were able to adjust the shot by attracting a new partner with a wealth of expertise in early 2016. **Végétolab** Végétolab Inc. is a company specializing in the development of protocols and laboratory multiplication of different plants by in-vitro culture from meristem. In other words, they are able to multiply rapidly and almost to infinity each clean (i.e. nematode and viruses-free) bulbil they collect the meristem from. And within the same year they can bring each of these clones to produce a round. These rounds are then cultivated for three years on the multiplying farms (I save you the details of the rigorous specifications which they must respect).

So, a Music round planted, say, in October 2016 will give one bulb (F3) in early August 2017, which will then be cracked into an average of 4.5 cloves to be planted two months later, and so on until certified F5 are ready to be distributed to Quebec producers. We now have a clean Music seed bank, the Végétolab Development General Director Martine Girard told me yesterday. Think about it, it is an extraordinary security for all Quebec producers! When asked if the same could be done with other varieties of garlic she answered in the affirmative, although with caution because it is necessary to have healthy material to start with, and also a protocol has to be developed for each new variety. So yes, it's possible, but not easy. And probably not cheap. The protocol is in place, the machine works. It now only remains for it to grow, and reach its cruising speed. Only one other country in the world has such a system for the production of clean garlic, France. A French-speaking country. Is it a coincidence?

Valerie Curtis, writing in the *Journal of Epidemiology & Community Health*, wrote, “There is a link between dirt, disgust, hygiene and disease, but it is a link that predates history, that predates science and culture, that even predates Homo sapiens.”

soil, noun: the upper layer of earth in which plants grow, a black or dark brown material typically consisting of a mixture of organic remains, clay, and rock particles; a mixture of organic matter, minerals, gases, liquids, and organisms that together support life.

dirt, noun: muck, mud, mire, sludge, slime, ooze, dross, grime, filth, dust, soot, crud, smut, smudges, stains, yuck, grunge, gunge; a substance, such as mud or dust, that soils people or things.

WHEN SOIL BECOMES DIRT

SOIL AND DIRT

Soil is a wonderful part of our natural world. It enables plants to grow and provide food for living creatures, be they humans, animals, birds, insects and or other organisms. Soil is a complex mixture full of organisms, both beneficial or harmful. Soil is essential to life. On the negative side, when you look at the bad side of soil, you look at organisms that can cause disease and even death. Soil is then looked upon pejoratively. It becomes dirt. The human race has developed methods of controlling disease and death caused by harmful organisms found in the soil through hygienic practices such as washing.

BRINGING DIRT INTO THE KITCHEN

Think of what bacteria are growing on your cutting board on the kitchen where you prepare your food. Raw or cooked, all foods leave behind a residue of bacteria that can and do breed disease. Three common and deadly soil-borne bacteria are *E. coli*, the enteric bacteria that causes millions of deaths each year; *Clostridium botulinium* is the causative agent of botulism, another killer; and the pathogenic *Salmonella* bacteria that comes into contact with vegetables from the soil. There are dozens more, some even more deadly, with anthrax, tetanus and even Lyme Disease among them.

A useful reference on this vast topic is the European Union Joint Research Report entitled “Soil Borne Human Diseases” available on the Internet or from the EU Publications Office in Luxembourg. Most root vegetables such as carrots and potatoes with soil on them are thoroughly washed before putting them on the cutting board for preparation. Should you put dirt covered garlic on that

same cutting board? One wonders why gardening authors love to display photographs of bunches of dirty garlic on their pages? The popular image of dirty garlic has even been adopted by many supposedly “organic” growers who tell their customers that organic produce must have dirt!

BRINGING DISEASE INTO YOUR FIELD OR GARDEN

New diseases are most often introduced to your garden soil via infected garlic or the dirt that it carries. *The Compendium of Onion and Garlic Diseases* lists 60 diseases, all of which can be soil-borne except for three which are spread by viruses. Cornell University, a leading Agriculture Research Centre in the USA, recommends avoiding the spread of infested soil to new fields as a basic management strategy.

Garlic sold for seed has to be thoroughly cleaned of dirt, washed if necessary, especially to remove all the little particles carried in the roots. That bit of dirt can carry a multitude of diseases from the grower’s soil and deposited in your garden where the diseases will thrive and multiply. Once a disease has been introduced, the gardener faces a new challenge of trying to clean up the disease organisms in the soil and replacing his own seed stock with fresh, new planting stock.

“AN OUNCE OF PREVENTION IS WORTH A POUND OF CURE”

Benjamin Franklin had it right. The work and problems are best avoided by not buying and planting dirty garlic. Bring only clean garlic into your field or kitchen.

A COMPENDIUM OF GARLIC TIPS FOR HOME GARDENERS WHO GROW ORGANICALLY

Garlic thrives in rich, organic soil. No matter how small your garden, rotate your planting and restore organic matter to the soil. Avoid using pesticides and synthetic fertilizers. Use techniques like mulching for weed control and moisture conservation and raised beds for better depth of soil. Your garden and plants will love you. Growing organically doesn't necessarily mean "Certified Organic" this latter being a business decision on marketing.

GARLIC PLANTING GUIDE

Group Cloves Per Bulb** Seed Bulbs for 25'

Porcelain 2-6 (average 4) 12-13

Purple Stripes 6-9 (average 7) 10-11

Rocamboles 6-9 (average 7) 10-11

Artichoke 6-12 (use 8 best) 8-9

Silver skin 7-12 (use 8 best) 8-9

Turban 4-8 (average 6) 8-9

Creoles 4-8 (average 6) 8-9

**The number of cloves per bulb varies with region, climate, and soil and from year to year.

HOW MUCH TO PLANT?

Eating on average one clove a day or a bulb per week requires 60 bulbs per person per year. Garlic lovers eat more. Add another 15-20 bulbs to save for next year's seed. 80 plants need about 25' of row. For block planting, an area 4'X8' will do. Multiply amount by number of people.

FRESH GARLIC YEAR ROUND

Succession plant bulbils, rounds, or small cloves every few weeks for a steady supply of garlic greens. In the winter, grow in pots on the windowsill.

VARIETY IS THE SPICE OF LIFE

To get the best choice of flavours and have fresh garlic year-round, grow cultivars from all Varietal Groups. Here's a suggested guide to varietal groups and cultivars:

EARLY HARVEST: Turbans Creoles or early Rocamboles, like Fish Lake F1, Israeli or Yugoslavian. These are ready early July for pickling needs, the BBQ and the earliest garlic. Not long keepers so use these up by Christmas.

FALL & EARLY WINTER USE:

A main crop Rocamboles like one of the "Reds", Czech, German or Russian; for gourmet beauty, grow the huge Purple Stripes, like Czech Broadleaf. These last till February or March.

MIDWINTER USE:

The Porcelains. For those big bulbs, grow Majestic, Fish Lake F3 or Romanian Red; for hotter but smaller bulbs, Georgia Fire. Porcelains are generally good until March or April when they break dormancy, start to root swell and lose their sweetness.

LONG KEEPERS:

These are the lovely, braidable soft necks, either Silver skins or Artichokes. They have less heat but finer flavour than hard necks and are still juicy when you're waiting for the new garlic to emerge in the spring.

- GSF/CORNELL REPORT #387 (10 pgs.) (Comes with membership) _____ x \$ 3.00 = _____
- GROWING GREAT GARLIC (Engeland, 213 pgs.) Grower's Guide for Collectors _____ x \$16.95 = _____
- MAD FOR GARLIC (Pat Reppart, 157 pgs.) Cookbook _____ x \$10.00 = _____
- ONIONS & GARLIC FOREVER (Louis Van Deven) New Edition of Book, 114 pgs. _____ x \$ 8.50 = _____
- GARLIC! GROW WEST OF THE CASCADES (Frank Parente, 88 pgs.) Grower INFO _____ x \$10.00 = _____
- IT'S A LONG ROAD TO A TOMATO (Keith Stewart, 276 pgs.) Ag Memoir _____ x \$16.00 = _____
- THE COMPLETE BOOK OF GARLIC (Ted Jordan Meredith, 332 pgs.) _____ x \$40.00 = _____
- GARLIC AND OTHER ALLIUMS (Eric Block} _____ x \$40.00 = _____
- GARLIC: An Edible Biography (Robin Cherry} _____ x \$17.00 = _____

- GARLIC PRESS SETS**
- Set #1 (Issues #1—#8) _____ x \$ 8.00 = _____
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 - Set #9 (Issues #48-#52) _____ x \$ 8.00 = _____
 - Any 2 Sets or more \$7.50 each _____ x \$ 7.50 = _____
 - All 9 Sets + #42 _____ x \$73.00 = _____
 - #42 BEST OF THE PRESS (20-year Retrospective) _____ x \$6.00 = _____

- GARLIC PHOTO CARDS**
- Beautiful Color from Eastern Exposures 4 cards _____ x \$8.75 = _____
 - 8 cards _____ x \$17.00 = _____

- IDEAL CAPE COD WEEDER (perfect hand tool for garlic) _____ x \$12.75 = _____
- 3000'ROLL TUBE MESH _____ x \$90.00 = _____

SUB TOTAL _____

GSF Cookbook is finally in print and now available.

GARLIC FARMERS COOKBOOK

_____ X \$18.00 = _____

Make Checks Payable to:

TOTAL _____

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*Non-members - please add 15% for shipping and handling

*PLEASE - U.S. FUNDS ONLY

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