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# Field Notes

TOM HENRY

## Miscellaneous myths, momentum

Farmers like to think farming is unique but from the business aspect at least that is a conceit unsupported by reality. Sure, farming is difficult to make money at and easy to lose money at but lots of small businesses and even not-so-small businesses go belly up all the time.

There are fewer farms in Canada each year. They fold up, close up, sell out. But the same is true of corner gas stations and cobblers. Compared to video rental outlets, farmers are thriving!

An article in *Tree Service Canada*, a sister publication of *SFC* aimed at commercial arborists, said that a startup tree service company should expect to operate for a decade before turning a true profit. A tree service company is a capital intensive, labour intensive operation deeply affected by weather. Sound familiar?

A related myth: farming is unique in that farmers only profit at the expense of other farmers. A hum-dinger of a crop on the Prairies drops the price of barley below the cost of production, which means cheap feed for livestock producers. Non-stop rain makes for lousy hay, but the regions that missed the downpour? Their high-priced hay is a moneymaker. One farmer has to lose for another farmer to win.

But, really, how unique is that? For every dollar per hour a company doesn't pay its employees, it benefits. If the café kitty-corner to my restaurant has a food safety issue, guess who benefits from whose loss?

Think of business, or even capitalism, in this way and it's hard to find a circumstance where enterprise thrives without stomping on someone, or something. Maybe it's a physics law applied to business: for every action there is an equal and opposite reaction.

Let's stretch this out to see where it goes. A copper mine opens: shareholders, employees and users of copper win; the environment, and maybe the trapper

who worked the area, loses. A high-tech startup develops an exercise app that helps people get the best deals at fitness centers: sounds harmless enough. But the winners are going to be the company that developed the app and the businesses that market themselves on it, but at the expense of the outfits that aren't featured.

Sheesh. I like the thought of getting ahead but I'm not so keen on doing so if it means leaving footprints on someone's forehead.

\* \* \*

Repeated annual droughts and a consequent increase in irrigation have recently introduced to me the concept of momentum in crops, especially grass. Up to about three years ago rainfall patterns were consistent enough to develop an annual grazing plan. By lambing in December we had peak sheep at the same time we had peak grass; come June the grass started to dry but the lambs were going to market. Early September rains usually meant the fields were greening up in October, about the same time the now-pregnant ewes' nutritional needs were increasing.

Inconsistent and reduced rainfall meant the old pattern didn't work, so we upped the acres in irrigation. And here's where the concept of momentum comes in. If we are really on the ball and get the irrigation on the fields as soon as the hay is off (in late May, into June in these parts) then the grass barely slows before getting another growth spurt. But if we tarry, the field dries and it takes far longer—meaning more water, more labour moving pipes or irrigation reels—to get the grass going again.

So, in my hesitating, lurchy, sunblasted way, this farmer learns: be it lambs, piglets or newly seeded fields—get them going and keep them going.

Keep them going!

## LOSING GROUND

### Treating soil degradation

David Lobb on how to combat the effects of erosion

BY MATT JONES

Soil degradation is becoming an increasingly common talking point among Canadian farmers and regulators. Concern over the phenomena has been growing for decades and has driven the no-till movement in farming. But no-till is not enough. Other practices must be undertaken to help replenish the soil and to prevent further erosion.

Soil degradation is the loss of essential nutrients and organic matter in soil, caused by salinization and erosion due to natural processes such as rainfall, wind and ice, as well as practices such as tillage. Canadian Federation of Agriculture (CFA) Director

of Science and Environment Policy Frank Annau says that soil degradation is a crucial issue for Canadian agriculture.

“It not only diminishes productivity, but threatens the ability of agriculture to mitigate climate change impacts,” says Annau.

A panel of experts recently testified to the Senate committee on Agriculture and Forestry, urging further attention from government on this issue. David Lobb, a professor of Landscape Ecology at the University of Manitoba, made the case for a national team of permanent staff to conduct soil surveys, terrain analysis and Geographic Information Systems analysis. Lobb spoke to *Small Farm*

*continued on page 6*



David Lobb says that soil degradation occurs in all parts of the country and can take decades to recover, with much of Canada's degradation going back to the sixties and seventies.

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## LOSING GROUND

### soil degradation *continued*

Canada about how extensive the problem of soil degradation is and how to reverse the effects.

“In the late seventies or early eighties, an economic analysis said that soil degradation caused an annual \$1 billion dollar loss, in 2019 dollars,” says Lobb. “Now it’s a \$3 billion loss. It’s gotten worse and the nature of the economics of crop production has changed. Farmers are producing more crops and they’re producing more high value crops, like soybeans, than they were back in the seventies. And what was a 10 per cent loss in crop yield back in the 1970s or early eighties now means a lot more in absolute terms. The cost of lost soil is more valuable now.”

Some had hoped that converting to no-till farming systems would solve the problem, but Lobb notes that no-till doesn’t fix the problem or reverse the damage; it simply prevents it from getting worse. And even refraining from traditional tilling may not stop all damage.

“One thing people don’t realize is that any form of disturbance is tillage,” says Lobb. “It’s not just the plow, any practices that disturb the soil—seeding and harvesting crops—can actually be more erosive than all the primary and secondary tillage operations combined. Even if you eliminated all primary and secondary tillage, if you have some form of disturbance in the operation, it may be enough to resist the recovery of the soil.”

Lobb identifies three key practices that can be used to help replenish soil. First, is to grow crops that



Frank Annau, director of science and environmental policy with the Canadian Federation of Agriculture, notes that while a reduction in tillage has shown a decrease in soil erosion over the last several decades, it is still an extremely important issue for Canadian agriculture.

produce more biomass—corn or other forage crops will help beef up the organic matter that will help restore the soil. A second solution, utilized by many farmers in the prairies, is to import organic matter biomass in the form of manure. Lobb says many farmers use particularly rich dairy cow manure to help build up organic matter in areas where organic levels have been depressed.

The third method has to do with where displaced soil actually goes. When soil is moved by water or wind or tillage, if the field is on a hill of any kind, the soil can roll downhill. Thus, Lobb recommends the practice of soil landscape restoration.

“It’s simply moving soil from the bottom of the hill where it’s been accumulating back to the hilltop,” says Lobb. “Put a small amount of organic rich soil back on the hilltop

and we see an immediate response where the yields bounce right back up. The majority of the soil that’s lost from those hilltops simply gets deposited at the bottom of the slope. So we have some areas in the landscape with half a meter to a meter of organic-rich topsoil at the bottom and it’s not being utilized. That is probably the most cost effective and rapid way to restore soil.”

Asked whether the industry at large would be likely to implement such measures, Lobb has faith in the farmers—they are the ones who developed these measures after all, and they are the ones who will be directly affected by soil degradation. He is less confident, however, that government agencies will respond appropriately.

“There is a lot of inertia and they want to do things they’ve always been doing and support programs that we’ve had for decades. Suggesting to move soil is not something that fits into their narrow little perspective of how to deal with the problem. They don’t want to accept the fact that tillage erosion is a real problem. They’re the ones that are most resistant to change, not the farmers.”

Representatives for Agriculture and Agri-Food Canada declined to make a representative available for an interview with *SFC*, but they did provide a fact sheet on combating soil erosion with the following recommendations.

-Soil conservation practices such as conservation tillage, mulching and structures such as terraces and

*continued on page 7*

## LOSING GROUND

### soil degradation *continued*

grassed waterways can help reduce water erosion.

-Minimizing tillage passes and controlling the variations of tillage speed and depth can reduce tillage erosion.

-Landscape-based integrated soil conservation in farm fields can make these remedial measures more effective. For example, grassed waterways should be placed along natural flow paths and terrace systems should only be constructed on long slopes using well maintained grassed waterways as flow paths.

Annau notes that CFA's efforts to stem soil degradation include the promotion of best management practices to improve soil quality

and successfully lobbying for the consideration of agriculture as an offset sector under Canada's Carbon Offset System.

"We are currently advocating for the adoption of carbon offset protocols, which would allow farmers to sell carbon offset credits for BMPs such as conservation cropping and winter cropping," says Annau. "In the case of conservation cropping, this reduces or eliminates the use of tillage machinery used to prepare crops for planting."

CFA is also active in advocating that government continue funding for programs that promote research and develop for farming methods that reduce soil degradation.



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### AGENDA HIGHLIGHTS

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Dick Wittman, *Wittman Consulting*



#### Mental Health Matters! Taking Care Of Business: You And Your Farm

*Canadian Centre for Occupational Health and Safety*



#### Secrets To Success: Canada's Outstanding Young Farmer

Amy Cronin, *Cronin Family Farms*

#### Bridging The Gap: Farm Transition Panel With Brent Vanparys BDO

Terry Betker,  
*Backswath Management Inc.*



#### International Collaboration to Improve Skills Training

Gavin Robertson, *Garage D'or Ciders*



#### What's Their Beef With Beef?

Ellen Crane, *Beef Cattle Research Council*

#### Cultivating Innovation Through On-Farm Trials - Shelley Spruit, *Against The Grain Farms*

#### Black Swans - Friend Or Foe?

Don Buckingham,  
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## WELL-BEING

# Soul support

The House of Commons Standing Committee on Agriculture and Agri-Food has released its findings after a seven-month study of the unique mental health challenges that Canadian producers face.

Released in May, the Committee's report, *Mental Health: A Priority for our Farmers*, concludes that the current state of support for farmer mental health is not adequate.

"Access to mental health care is still limited in rural areas, health professionals are still not familiar with the unique nature of agriculture and current efforts to help farmers are not consistent across the country," it reads.

The report delivers ten recommendations to the Government of Canada, including points urging the Government to improve consultation with producers before enacting regulatory changes, and fund accredited programs that specifically support mental health in agriculture. The Committee requested an official Government response.

The study ran from June 2018 to January 2019, and gathered testimonies or briefs from more than 45 witnesses.

Dr. Andria Jones-Bitton, Associate Professor at the Ontario Veterinary College at the University of Guelph, testified about her research on farmer mental health. Her 2015 survey of Canadian farmers found that 45 per cent of respondents experience high stress, 58 per cent qualify as having anxiety, and 35 per cent meet the definition of depression.

She thinks the Committee's report is a positive step towards addressing these figures.

"I believe the recommendations are sound, grounded in evidence from our research and from the witness testimonies, and that acting on them will help to reduce several of the occupational stressors our farmers experience that are negatively impacting mental health," she says.

Adelle Stewart, Executive Director of the Do More Agriculture Foundation—a non-profit organization

## Federal Government Standing Committee releases report on farmer mental health

founded in 2018 to support the mental wellbeing of Canadian producers—feels that the report lays a strong foundation for future work.

"Improving our mental health literacy, support, and resilience in ag is a long-term, collaborative initiative, and the [report's] recommendations provide a structure for moving forward as well as goals that have the ability to be measurable over time," she says.

But whether the Committee's request for an official Government response will be answered is unclear. A government has 120 calendar days to table a response, but there is no mechanism to sanction one that fails to do so. Furthermore, the dissolution of Parliament removes the requirement to respond, though a re-assembled committee may choose to request response to a previously-tabled report.

Bob Guest, who testified before the Committee in his role as Chair of the volunteer-run Canadian Farmers with Disabilities Registry, hopes this isn't the last he hears from the Government about farmer mental health.

"I think the recommendations [in the report] are fine, it's whether we go through with them or not," he says.

"I hope it doesn't just get shelved. We've been working on mental health for agriculture, and for years it's been ignored what's happening out in the country. People seem to want to close their eyes to it."

But Guest notes that he has seen increased interest in farmer mental health and the Canadian Farmers with Disabilities Registry recently, including by potential corporate sponsors.

At the Do More Agriculture Foundation, Stewart agrees that public awareness is shifting. "There has been a growing curiosity about why this sector is unique in our stressors, and the authenticity about seeking to understand our lives and industry has been really refreshing," she says.

"At the same time, not every producer is ready to have this conversation with a stranger at the terminal . . . or in their day to day conversations."

-Lily Jackson

## WELL-BEING

### Further Reading

#### “In the Know”

Dr. Andria Jones-Bitton and her team at the Ontario Veterinary College have developed “In the Know”, a program designed to support mental health literacy for people in agriculture. The program includes a course—delivered in a range of formats to suit different participants—that addresses topics like the stigmas associated with mental illness, and how to have conversations about mental health with someone who may be struggling.

Dr. Jones-Bitton says a pilot program for a four-hour, in-person version of the course was completed this spring. If data analysis proceeds as planned, she anticipates the program will be released in late summer or early fall. “We will be sure to communicate the release with the agricultural community once it becomes available,” she says.

#### Do More Agriculture Foundation

The Do More Agriculture Foundation works with partners to fund and deliver projects that support mental health awareness, community-building, and research. The organization’s Executive Director, Adelle Stewart, says that in the just over 18 months since it was founded, the Foundation is proud of the work it has done to make mental health in agriculture a priority now and for the future.

“I see Do More Ag continuing to lead the charge in being a voice for producers, a safe space for sharing and the pinnacle for solutions in improving the state of mental wellness in Canadian producers,” she says.

The Do More Agriculture Foundation website features a cross-Canada list of mental health resources. For more information, visit [www.domore.ag/resources](http://www.domore.ag/resources).

#### Canadian Farmers with Disabilities Registry

Bob Guest, Chair of the Canadian Farmers with Disabilities Registry (CFWDR), says the organization is the only one with a national mandate to work directly with disabled farmers. Part of its job is to send a volunteer farmer with a disability to visit an injured or ill farmer and their family, helping them feel hope and support as they think about returning to work.

Guest says it’s critical for small, volunteer-run organizations that work directly with farmers to receive consistent government funding. In CFWDR’s case, federal budget cuts and the introduction of grants that require matching funds has put the onus on volunteers to fundraise.

“We want to go out and do the visitations and help people on the farm, as well as help the family on the mental health side of it to continue farming. That’s what we want to spend our time doing, not chase down sponsorship,” Guest says.

To learn more, visit [www.cfwdr.com](http://www.cfwdr.com)

-LJ



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## BOOK REVIEW

# Smart small

*Compact Farms: 15 Proven Plans for Market Farms on 5 Acres or less.* Josh Volk. 2017. Storey Publishing, 226 pages.

Reviewed by Janet Wallace

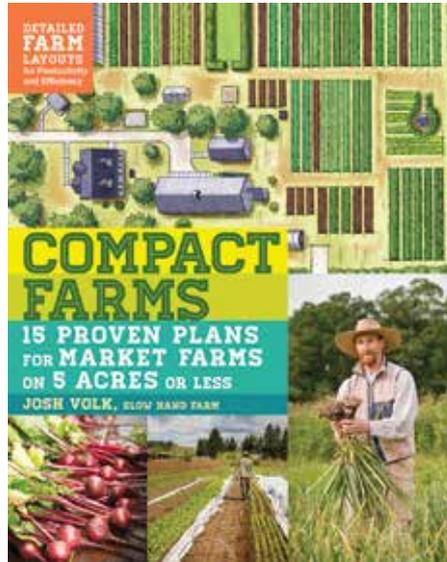
When I first flipped through *Compact Farms: 15 Proven Plans for Market Farms on 5 Acres or less*, I thought it was just a pretty book. *Compact Farms* is full of beautiful pictures, colourful charts and lovely diagrams of farm layouts. I thought it was a book that would appeal to people dreaming of farming, but not actual farmers.

I was wrong.

Josh Volk writes like he farms — with great efficiency. Just as he managed to run a farm on a 0.15-acre piece of land, he has squeezed an incredible amount of valuable information into 226 pages. The writing isn't flowery or poetic — just detailed information on how to run a small farm.

Most of the book consists of 15 farm profiles; one is Canadian and the others are American (including an urban rooftop garden). A couple may be familiar to many readers such as Eliot Coleman's Four Season Farm and Les Jardins de la Grélinette of Jean-Martin Fortier. They grow vegetables, and a few also have flowers or livestock.

Each profile describes a farm's market, labour, tools and infrastructure, including irrigation, trellising, post-harvest techniques (such as washing stations) and record-keeping methods and software. I appreciated the descriptions of equipment. For example, many farmers explain which seeders they use for which crops and why. Many of the farms have tillers, and the make is specified. A few use only hand tools; several have small tractors. One has "an Allis-Chalmers Model G converted to electric that runs on golf-cart batteries." Another uses a "Bullitt cargo bike" equipped with "BionX electric assist" to deliver CSA shares.



New and 'wannabe' farmers may be motivated and educated by *Compact Farms*, while experienced farmers can glean a number of valuable tips from the profiles of these successful small farmers.

The author and several other farmers say they were inspired by John Jeavons 1974 book *How to Grow More Vegetables, Fruits, Nuts, Berries, Grains, and Other Crops than You Ever Thought Possible on Less Land than You Can Imagine*. Many farmers do use modern techniques, such as flame weeding. One farm uses organic no-till by using

the roller on the back of a flail mower to crimp stalks of rye and vetch, and then cutting slits into the cover crop using coulters mounted on the tractor toolbar.

For pest control, many growers use floating row cover. The author uses Agribon AG-19, which is held in place with "6-inch ground staples and old barn boards." Other methods include dipping cucurbit seedlings into kaolin clay before transplanting to deter cucumber beetles. Another farmer plants Hubbard squash as a trap crop and later sprays it with pyrethrum or leaves it to be consumed by the beetles.

Trellising is described in detail, as is post-harvest methods. For example, the author describes packing his CSA shares into "organic cotton bags, washed the night before and left damp. The moisture helped keep the produce hydrated and cool." To pack them, he hangs the bags on two-by-twos supported by saw horses.

The book is inspiring with the stories of how much can be grown on a small piece of land. New and 'wannabe' farmers may be motivated and educated by the book, while experienced farmers can glean a number of valuable tips from the profiles of these successful small farmers.

## BOOK REVIEW

## Plant doctoring

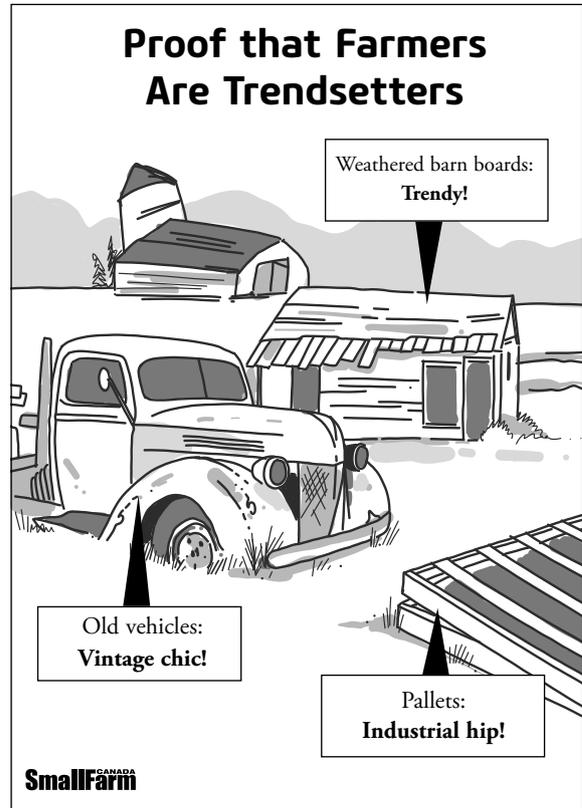
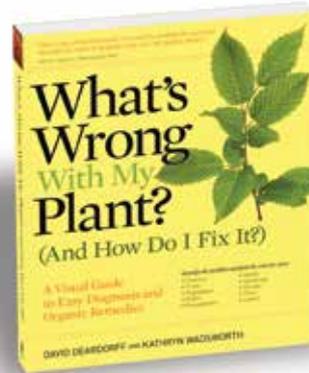
*What's Wrong With My Plant? (And How Do I Fix It?)* By David Deardorff and Kathryn Wadsworth, Timber Press. 2009. 451 pages.

Reviewed by Janet Wallace

I love the idea behind *What's Wrong With My Plant? (And How Do I Fix It?)*. The book has the ambitious goal of, as the subtitle states, providing “A visual guide to easy diagnosis and organic remedies.” It not only deals with garden plants but also houseplants, trees and lawns. The book contains various flow charts (many with diagrams) to help you identify the source of the problem by looking at the symptoms, such as leaf discolouration, holes in leaves, spots on fruit etc. A reader can, theoretically, just answer the questions, such as “Are there holes in the stems? If yes, see . . . if no, see . . .” and eventually arrive at the identity of the pest.

The book can be useful. I looked up several problems people often ask me about (e.g., seedlings that disappear, stunted zucchini, purplish leaves on seedlings). I followed the guides and found the answers to the first two (cutworms and poor pollination, respectively). The purplish leaves weren't listed in the leaf discolouration section but instead under “seedlings grow poorly.” The diagnosis was accurate (phosphorus deficiency) but the suggested remedy was to supply phosphorus (P). The authors didn't mention that P is tied up in cold soils. A temporary P deficiency is common in the spring and if you add extra P, you may end up with excessive nutrient levels later in the season.

The remedies for many problems are quite general and focussed on prevention. This can be frustrating when you want to solve a problem immediately and find the answer is crop rotation and providing habitat for beneficial organisms, but this really is a sound approach.



Also, there are specific remedies for certain pests.

Although the authors clearly state that readers should take the time and follow the questions in the flow chart, I found the greatest value in two other ways. First, I identified certain pest problems by simply flipping through the 80-page “Photo gallery of common problems” until I found a picture that matched my crop. The other technique was to look in the index for what I thought

might be the source of the problem; if my diagnosis wasn't correct, I was likely in the right flow chart and could look for other options.

Overall, the book can point you in the right direction and can often, but not always, answer the questions “What's Wrong With My Plant? (And How Do I Fix It?).”

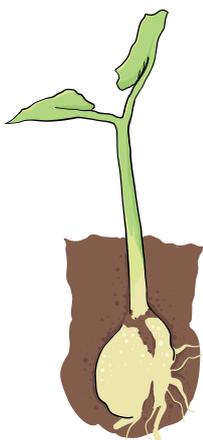
## Seeds: a complete package

When you stop and think about a seed, it's really quite incredible what is contained within the tiny structure. A seed contains the genetic information needed to produce a new plant along with sources of energy to help the seedling get started. Recent research reveals that a seed can contain even more resources. The outside of a seed can be covered with microorganisms that can help the plant grow. The microorganisms remain dormant until the seed germinates and then they colonize the newly emerging roots.

Scientists found that the community of plant growth-promoting bacteria on tomato seeds somewhat reflected the growing environment of the parent plant. Seeds from plants grown in the field were dominated by bacteria that can control plant diseases. In contrast, seeds grown in the lab with no pathogens and a low level of nutrients were hosts to relatively more bacteria that help plants access nutrients and fewer bacteria that control plant disease.

While the researchers suggest the findings may be used to develop seed treatments, another take-home message could be to use seed from plants grown in similar conditions to your own growing conditions.

Source: Bergna, Alessandro, Tomislav Cernava, Manuela Rändler, Rita Grosch, Christin Zachow, Gabriele Berg. 2018. *Tomato Seeds Preferably Transmit Plant Beneficial Endophytes*. *Phytobionomes Journal*. Volume 2, Issue 4, Pages 183-193.



## Organic farming helps bees

Honeybees benefit from foraging on organic farms. Pesticides have been linked with colony collapse disorder so it is logical to assume that organic foraging

grounds are better than non-organic. French researchers found that there are even more benefits to having beehives near organic farms. Hives close to organically managed fields had greater performance, including a higher number of living bees and greater worker brood production. This may lead to greater winter survival.



A main benefit from organic farms is the diversity and abundance of food for the honeybees. The non-organic fields tended to have peak flowering times of crops and a lack of flowers in between. In contrast, the organic farms had not only a greater diversity of flowering crops, but also flowering cover crops and weeds, and had flowering plants throughout the growing season. Honeybees benefit from a steady supply of flowers, as well as a variety of flowers.



Source: Wintermantel, Dimitry, Jean-François Odoux, Joël Chadœuf, Vincent Bretagnolle. 2019. *Organic farming positively affects honeybee colonies in a flower-poor period in agricultural landscapes*. *Journal of Applied Ecology*. Published June 25. <https://doi.org/10.1111/1365-2664.13447>

## Cover crops and wet spring weather

In parts of Eastern Canada, cool wet springs seem to be becoming the norm. As a result, farmers can't get onto their fields early in the spring, particularly if they have heavy clay soils. For no-till farmers, the problem is even worse. Overwintered cover crops, depending on how they are managed, may help with this problem by taking up moisture from the soil.

Researchers in Pennsylvania compared two approaches to no-till growing of corn and soybeans. The more common method is to 'terminate' a cover crop using herbicides and plant a couple weeks later. The approach under investigation involved letting the cover crop grow, planting crops into the living cover crop and then killing the cover crop a week later. This approach helped dry out the soil. Also, the extra three weeks of growth

provided extra biomass that protected the soil and conserved soil moisture throughout the summer. This did, however, reduce soil temperatures and the corn yield was slightly lower as a result (but the soybean yield wasn't affected).

The researchers had hypothesized that the living cover crop might reduce slug damage by providing an alternative food source for the slugs. However, the effect of the cover crop on slug damage was inconclusive as it varied between years, crops, fields and types of cover crops.

Source: Reed, Heidi K., Heather D. Karsten, William S. Curran, John F. Tooker, Sjoerd W. Duiker. 2019. *Planting Green Effects on Corn and Soybean Production*. *Agronomy Journal*. Volume 111, Issue 5, pp. 1-12.

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## Flowers: viral hotspots

While hives of honeybees have been destroyed by colony collapse disorder, viruses and mites, wild pollinators have also been in decline. Honeybees are part of the problem.

In Vermont, scientists examined wild bumblebee populations. They found that the incidence of viruses, particularly deformed wing virus and black queen cell virus, were higher when infected honeybee hives were nearby. In fact, they found no incidence of deformed wing virus in bumblebees in areas more than one km away from apiaries.

After further investigation, the scientists discovered that the flowers around commercial beehives contained the viruses. In the same way that a bee pollinates flowers by spreading pollen from one flower to the next, the bees also transmitted viruses, which were picked up by bumblebees who visited the same flowers. In areas with sensitive populations of wild pollinators, the scientists suggest limiting commercial hives and/or increasing the monitoring of virus loads within hives.

Source: Alger, Samantha A., P. Alexander Burnham, Humberto F. Boncristiani, Alison K. Brody. 2019. RNA virus spillover from managed honeybees (*Apis mellifera*) to wild bumblebees (*Bombus* spp.). PLOS ONE. Volume 14, Issue 6.



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# RESEARCH NOTES

## Light for layers

Vitamin D deficiency is common in people in Canada and other northern nations. In the summer, sunlight provides vitamin D, but in the winter that vitamin comes from our diet, particularly egg yolks, oily fish and fortified dairy products. To try to increase the level of vitamin D in eggs, scientists provided supplemental UVB light to poultry layer flocks. The fluorescent tube lights were placed just above the bedding in the barns because the legs of the birds contain the highest concentrations of the precursor to vitamin D.

The project was a success. Using UVB lights for six hours a day led to an almost four-fold increase in the level of vitamin D in the eggs.

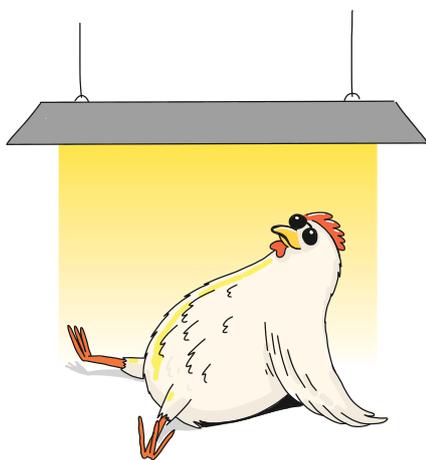
A concern was the possible effect of the light on behaviour. In the commercial poultry industry, light levels are often kept low because it is believed that lighting leads to aggression (feather-picking and subsequent cannibalism). In the study, there was no evidence of increased feather picking even at the density commonly used in furnished cage systems (i.e., 12.3 hens/m<sup>2</sup> or 60 hens in a 4.88 m<sup>2</sup>-cage).

In an earlier study, the lead researcher found that keeping chickens outside also led to a four-fold increase in the vitamin D content of eggs. The effect depended on the amount of time the birds were outside in the sun. Layers kept inside with access to the outside had eggs with higher vitamin D concentrations than eggs from birds that never went outside, but lower than the birds that lived outside. The researchers stated, "In contrast, free-range eggs randomly acquired from supermarkets had relatively low vitamin D contents."

An aside: Dr. Kuhn also found that dark chocolate contains high levels of Vitamin D.

Sources: Kuhn, Julia, Corinna Wassermann, Stephan Ebschke et al. 2019. Feasibility of artificial light regimes to increase the vitamin D content in indoor-laid eggs. *Poultry Science*. Pages 1-11. 10.3382/ps/pez234

Kuhn, Julia, A Schutkowski, H Kluge, F Hirche, GI Stangl. 2014. Free-range farming: A natural alternative to produce vitamin D-enriched eggs. *Nutrition*. Volume 30. Issue 4. Pages 481-484.



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# Poultry

AMY HOGUE

## Talking turkey

### In defence of a much-maligned bird

Domesticated turkeys get a bad rap — often referred to as one of the dumbest animals on the planet, turkeys have been the brunt of more than one joke. Desperately homely, comically ungainly and sure, maybe a little dumb, it's almost too easy to poke fun at turkeys.

Have you heard these old-time favourites: What did the turkey have for Thanksgiving dinner? *Nothing, he was already stuffed.* Or: What does a one-legged turkey say? *Wobble-wobble.*

In spite of the jokes, turkeys are far from stupid, and have a distinguished background. Today's commercial turkeys are descended directly from a wild turkey in Mexico that was domesticated by the Aztecs about 800 B.C., called *M. gallapavo gallopavo*. This breed of turkey was transported to Europe by the Spanish and then finally brought back to North America by early settlers.

Anyone who has ever raised turkeys will have stories to tell of their apparent stupidity, their fragility to adverse conditions and their general oddness. For small farmers the benefits of keeping turkeys become more obvious in the fall and winter months when it comes time to celebrate Thanksgiving, Christmas and even Easter,

when their demand is highest and prices soar.

### Are they really that dumb?

Turkeys aren't the sharpest tools in the shed and have gotten themselves into more than one pickle due to limited intelligence. Rumour has it that turkeys are so stupid that they will stand outside in a rainstorm and look up at the sky until they drown themselves. This rumour isn't without merit.

In the early 1990s a professor from Oregon State University discovered that turkeys have an inherited neurological condition called "tetanic toritcollar spasms" which causes them to stare at the sky for 30 seconds or more, even during a rainstorm, although whether or not any turkeys have ever drowned doing this activity is subject to conjecture.

Phyllis James of Jameshaven Farm has been farming her 100-acre Eastern Ontario farm since 1964, and has raised 60 turkeys each year for the past 20 years. James has pretty much seen it all when it comes to these large feathered friends.

James says she's found that turkeys are no less intelligent than chickens, and have virtually no fear

*continued on page 18*





## Turkey lore

### Did you know?

A male turkey is called a tom; a female turkey is called a hen.

The name “turkey” was given to the bird based on its resemblance to “turkey cocks” found in Turkey.

Turkeys have two stomachs. Food first goes into the proventriculus, where it is partially digested with stomach acid. It then travels to the gizzard.

Turkeys have excellent vision and can see peripherally up to 270 degrees.

Male turkeys can be aggressive and even dangerous when threatened.

# Poultry



Phyllis James of Jameshaven Farm has been farming her 100-acre Eastern Ontario farm since 1964, and has raised 60 turkeys each year for the past 20 years.

— more curious than stupid. “They’re really nosy, they follow me around,” James said. “I was cutting weeds the other day and they were all around me the whole time, just looking up at me like they were wondering what I was doing.”

James’s experience makes sense: Turkeys are highly social animals that will socialize with humans and other animals and have a distinct hierarchy within their family groups. Such behaviour doesn’t typically manifest in truly unintelligent animals.

## The logistics of raising turkeys

Of course, when it comes to raising turkeys, there are some definite drawbacks. Turkey chicks cost more per chick than chickens, and depending on the breed, take approximately 16 to 22 weeks to reach maturity. Given the seasonal demand for turkey, a small farmer will have some logistical issues to deal with when it comes to timing, and a farmer will want to plan for their flock to be ready for slaughter just before Thanksgiving and/or Christmas. This way birds can be taken to slaughter, brought home and picked up or delivered to customers almost immediately.

Here’s why: If you’re raising 100 turkeys, and each turkey weighs approximately 20 lbs, those are big birds to be kept in any numbers in a freezer. In fact, most small farmers pre-sell their turkeys on the condition that when it comes home from the butcher, customers must come out and pick up their bird straight away.

Despite their larger size, turkeys are just as susceptible to predation as chickens, which can cause issues when it comes to the timing described above. In James’s case, this year she purchased her usual 60 turkeys, only to lose 36 three-week-old poults to a mink. She was lucky enough to find replacement chicks almost right away but the new chicks are too small to be raised with her original flock, and could also cause issues when it comes to timing for slaughter.

Another fly in the ointment is that unlike with chickens, customers often purchase only one or two turkeys, which means a broader customer base which is more work for a small farmer to maintain. That said, it’s the very seasonal nature of turkeys that gives a farmer more leeway when it comes to per pound price, and more potential for profit.

## Breeds, feeding and more

The American Poultry Association (APA) recognizes just eight breeds of turkeys: Beltsville Small White, Black, Bourbon Red, Bronze, Narragansett, Royal Palm, White Holland and Slate. Turkey size will depend on the breed, but most grow to somewhere between 12 and 20 lbs at 12-14 weeks; heritage breeds will take longer to reach maturity.

The most popular breed in North America is a hybrid not recognized by the APA, the Broad-Breasted White, a breed created by crossing the White Holland and Broad-Breasted Bronze. This breed grows quite large very quickly, with some resulting issues: Firstly, it cannot fly, and secondly, a tom will grow so large it will be unable to effectively mount a hen for reproduction. This breed is propagated through artificial insemination.

When it comes to housing, farmers should allow six square feet for each turkey. Brooding temperatures are also a little different for turkeys and overheating can be a real issue with many breeds. Turkeys can be transitioned to pasture at approximately four to six weeks.

You can purchase turkey feed which has been specifically balanced to meet a turkey's nutritional needs, (which will have more protein than chicken feed), but they can also fare pretty well on a chicken diet. Plan on consumption rates of up to 100 lbs per bird.

Otherwise, care for turkeys is pretty similar to chickens, so similar in fact that many small farmers are tempted (or have successfully) kept chickens and turkeys together in the same coop or pasture.

The cost for raising a turkey depends on the breed and your desired finish weight. One U.S.-based small farmer determined that when accounting for the cost of a chick, brooding costs (electricity etc.), slaughter fees and feed for a 12-pound conventional (non-heritage breed) turkey, the total comes to approximately \$32 per bird.

This cost doesn't take into account time and labour, and is based on U.S. pricing, but is still a good estimator. Please visit the website for a full breakdown of costs: [www.namimoonfarms.com/news/the-price-of-a-turkey](http://www.namimoonfarms.com/news/the-price-of-a-turkey).

*continued on page 20*



Just hanging out in the shade. Turkeys are quite social with each other and other animals, even people.



Phyllis James from Jameshaven Farm only purchases female chicks, which she's discovered means less fighting among birds. This young poult will be ready for slaughter in time for Thanksgiving.

# Poultry



With their slightly cross-eyed look, bowed legs and generally vacant expression, turkeys are awkward and comical looking enough to have become the brunt of an extensive repertoire of jokes.



Overheating is one issue that must be watched with turkeys. Shade should be made available, along with a ready supply of fresh water. Overheating can mean less food consumption, which equates to a slower growth rate.

## Turkeys and chickens — together?

There's some debate over whether you should raise turkeys and chickens in the same pen, and while many small farmers have successfully raised turkey and chicken flocks together, there are some reasons to keep them separate. For the most part, chickens like to hang out with other chickens, and turkeys like to hang out with turkeys. Your coop is kind of like a high school cafeteria in that regard.

It's not like keeping both chickens and turkeys in the same coop is impossible, so long as you take precautions to ensure both birds are having their nutritional needs met, have enough space and there's no bullying going on from the larger breeds.

Of course, there are other factors to consider, something James discovered firsthand. The dreaded blackhead is a disease that affects turkeys, chickens and game birds. Caused by the protozoa *histomonas meleagridis*, blackhead is spread to birds by a roundworm, *heterakis gallinarum*. Poultry can then spread the disease through fecal matter or through bird-to-bird transmission.

Turkeys, especially young turkeys, are highly susceptible to blackhead. The disease can spread quickly within a flock and has a mortality rate of between 70 and 100 per cent. In chickens, blackhead disease can impact overall health, but chickens can carry the disease throughout their lifetime and they can pass it on to turkeys.

James encountered blackhead during one of her first years raising turkeys and learned the hard way not to run turkeys on the same pasture as chickens. When her turkeys started getting sick and dying, she wasn't sure what the problem could be. She hadn't heard of blackhead disease, but once it caught her flock there was nothing that could be done to stem the losses.

"I lost all my birds that year," James said. "I sent some of the birds to the University of Guelph Kemptville Campus for diagnosis, and they told me it was blackhead disease. I haven't run them on the same yard since."

Whether or not to keep turkeys and chickens together is a choice each farmer must make for themselves.



## Your Source for Turkeys

### Orlopp Bronze

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### Artisan

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Shown here are the 36 turkeys James purchased to replace the ones lost through predation. Smaller than the first flock of chicks, James has yet to introduce the two flocks together, worrying the difference in size could be a problem.



James raises the Broad-breasted White turkey and said she found the ideal turkey weight to be between 16 and 18 lbs, cautioning against the “bigger is better” mindset when it comes to turkeys. “Any bigger and people won’t want them.”



# Equipment

DAN KERR

## Linked All about chains

There are as many types of chain as there are uses for it — everything from jewelry to ship anchors and all have specific criteria to meet with generally a very limited amount of maintenance to keep them working.

### Choosing chain

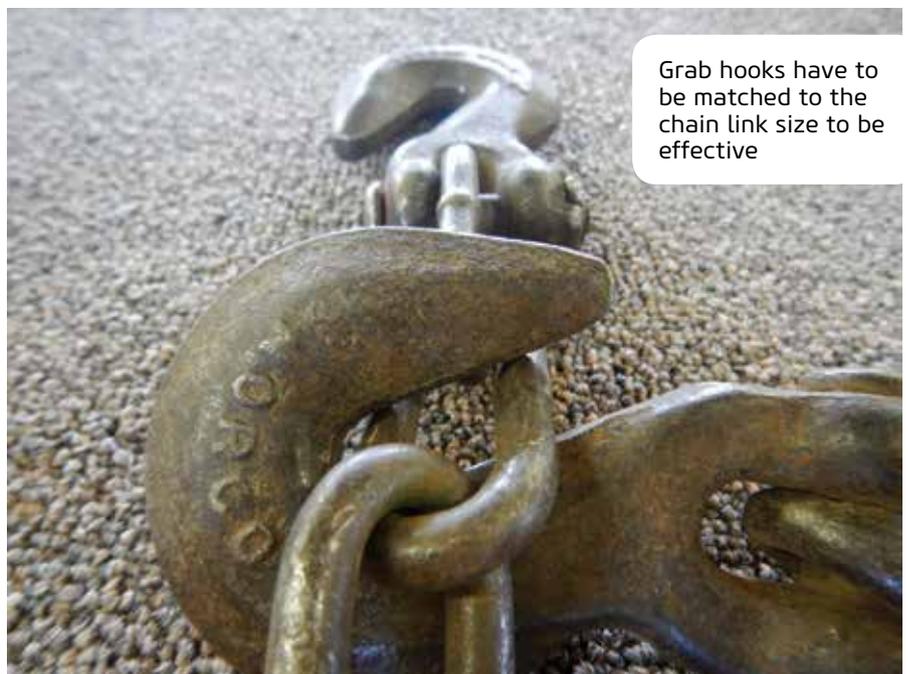
There are only about five things to consider when choosing a chain: grade, finish, link size, length and use.

**Grade:** All chain is graded. Common coil chain, that I have seen advertised as ‘proof chain,’ is the lowest grade of 30 which is determined by tensile strength. For grading, as the number goes up so too does the strength and price. By choosing a heavier grade you can reduce the link size which can reduce the cost of the additional hardware you need to put it to use such as clevis/pin, anchor shackle, eye hook, grab hook, slip hook, quick link or bolts for permanent fixes. As an example, a grade 70, 1/4 inch size chain is rated at a safe load of 3150 lbs which well exceeds a grade 30, 3/8 inch size at almost half the price.

Unlike bolts that have hash marks on the head to reveal their tensile strength, one of the unfortunate things about chain is that the grade is not stamped on it anywhere. If you go to purchase a new chain you will be able to check its grade marked on the end of its container before you measure what you want. I have a selection of chains in the shop and do not know what any are graded at.



Left is a link replacer which replaces the broken link and is then hammered flat. Quick links (threaded) come in a wide selection of sizes and are quick and easy to use



Grab hooks have to be matched to the chain link size to be effective



Hellen Lariviere from Bruce Mines Home Hardware, a small rural store, stands in front of their good supply of chain accessories; they also supply raw, plated and galvanized finish proof chain.

Generally for farm use, the bigger the load the bigger the chain you should use is what comes to mind. I have one chain fitted on both ends with grab hooks (a slot that the chain link fits into) and another chain fitted with a grab hook on one end and a slip hook on the other (allows the chain to slip through). I did this for versatility. The chain with grab hooks has a large enough link size to allow the use of quick links.

If the grade is crucial then you may want to spray paint a portion of one end to identify it or stamp the # on the hook.

**Finish:** Choices are self-coloured or bare metal, plated and galvanized. Most of the chain in use is in its raw state as it was manufactured, which is what all my chains are. If a chain is to be applied primarily for submerged use, a galvanized finish would be the call. With the added galvanized finish, the link will be enlarged and subsequent hardware should be fitted before purchase to ensure fit. And to keep everything proper all hardware should also be galvanized.

**Link size:** Choosing a size of chain (link) that will accommodate your use is directly related to the next heading. You are going to be adding attachments and knowing what they are will determine how large the link has to be. Something worth considering here is if your chain length will change for say, towing logs. You may want to look at a link large enough to accommodate an anchor shackle or clevis and pin rated to the load expectation. Either can be quickly moved and securely attached with the minimum of effort.

**Use:** Your use may affect what grade you have to buy. Jurisdictions may require a certain grade of chain for transport of product on public roads. Overhead lifting requires a heavier grade than 30 for the obvious built-in safety margin. Galvanized coating for use in constant moisture to prevent rusting is another consideration.

*continued on page 24*

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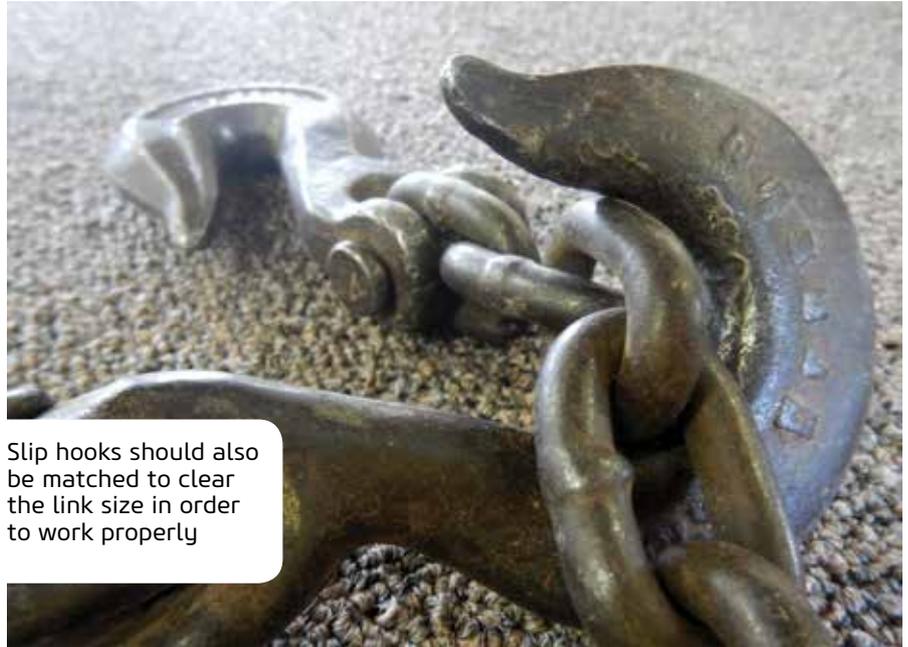
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# Equipment



Anchor shackles can be used to make a noose that will self tighten around an irregular load such as a brush pile but won't unhook



Slip hooks should also be matched to clear the link size in order to work properly



The load binder is opened latched to the link and then closed tight



Shown here is an eye hook (bright) which allows the load to swivel, a home made grapple and off set hook which come with the guarantee "If you break it you own both halves."

## Maintenance

About the only maintenance here is I wipe off any grit and try to store it dry to prevent rust. The only alteration I've ever made to one of my chains was the removal of a grab hook and installation of a chain slip hook. Links that break or become damaged can be replaced with a matched link replacer or quick link. I carry a couple of these in the tractor tool box just for the occasion but primarily for slack adjustment. For load tightening I acquired a small load binder which has proven an excellent choice as chains have a way of simply falling apart if the load shifts or twists; I found it on the side of the road.

For storage, I have a heavy box that they get placed into, not the best for organization, but the box is sitting on a wheeled dolly that I can just move up to the loader and drop it in. Works for me. I saw one farmer use large nails driven into a beam with his selection of chains wound around each nail; this is good, it allows the chain to drip dry and debris to self clear.

Load binders kind of go hand in hand with chain. If you try to tow something using just the hooks, inevitably they will come apart and at the worst time. I do not rely on those Mickey Mouse clips on the hooks to hold anything in place; I find them more of an interference than help.

Load binders are all load rated as well, not only for their capacity in pounds but for link size. There are generally two types, a simple offset lever type and the ratchet version. Once tightened down the ratchet version is pretty well on for the ride. The lever type has a hole in the end of the handle which is used to wire the handle to a link in the closed position as they can bounce free. A piece of pipe can be used over the handle to lock the lever binder in place but caution should be used here as too much pipe could overstress the handle to failure.

Note: all hardware, quick links, bolts, shackles, hook and links should be matched to or exceed the grade of the chain, hence the saying 'weak link'.





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Wild pollinators find food in runner blossoms.



# Rating Runner Beans

One summer, 11 varieties,  
and the winners are...

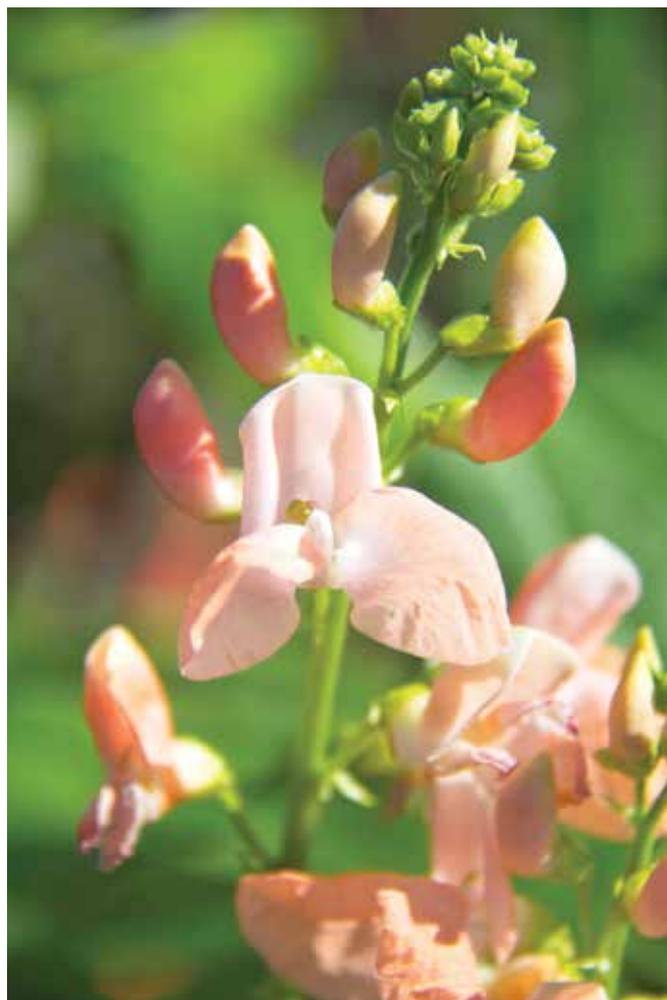
BY JANET WALLACE

The girl looks puzzled when I give her a beige, dry pod that's longer than her hand. Her eyes widen as she opens the pod and grins. "I've got magic beans," she squeals to the other elementary students. Soon all the kids want runner beans to plant (and some to stash in their pockets). The beans are perfect for the school garden, the big seeds are easy for little fingers to plant, and later in the summer, the kids can hide in the green, flower, adorned teepees.

I love growing runner beans. The plants provide so much food and beauty that I feel my garden would be incomplete without them. Yet, runner beans aren't ubiquitous in gardens, particularly market gardens. To share the joy, I'll describe the many benefits of growing runners and provide tips on how to grow and harvest the plants. I'll also let you know the results of my variety trial for *SFC*. I had the great fortune of comparing eleven (yes, eleven!) varieties of runners. Scarlet Runner is just one of several varieties of these amazing legumes.

First, a brief introduction: Runner beans (*Phaseolus coccineus*) is a separate species of bean, different from 'regular' green, string, wax or dry beans (*P. vulgaris*). It is technically a perennial but is usually grown as an annual crop. You can however, dig up the roots in the fall, overwinter them inside and plant them out the following spring. I've tried this but never found it as successful as just planting the beans each spring.

Runners are the ultimate multi-purpose plant. From the roots to the flowers, they help improve the soil, provide habitat for hummingbirds and other pollinators and add beauty to your garden. All parts of the plant are edible from the starchy roots to the leaves, from the flowers to the beans. (Disclaimer: I've never tried the leaves or roots and don't know if those are simply edible or actually worth eating).



High-yielding variety Celebration.

*continued on page 28*



Grow runner beans and you'll feed hummingbirds as well as yourself.

## Why grow runners?

Here are several reasons to grow this crop—starting from the roots and going up.

- **Nitrogen-fixation.** As with other legumes such as peas and clover, runner beans fix nitrogen. When you harvest the beans, you are, in a sense, removing much of this nitrogen, but there is still an advantage in that you don't need to give the crop N (as fertilizer or organic soil amendment). It will fix enough N from the air to meet its own needs.
- **Ease of cultivation.** Runners tolerate cool soil better than the more common beans. I plant them later than peas but before I plant common beans. Soaking them for a couple hours before planting will speed up germination but if you do this, keep the soil moist until they emerge.
- **Vining.** The word 'Runner' in the crop's name comes from the fact that it grows rapidly. Runners are vigorous climbers and can reach more than 10 feet tall. If you don't provide structures early enough, they will wrap around each other forming cords of twisted stems. This growth habit can be used to cover fences and provide shade and wind protection for other crops, such as summer and fall plantings of salad greens. I make bean teepees by pushing saplings (8-12 feet tall) in the soil all around my runner bed. I tie the tops together with jute or cotton twine. This structure is cheap (free), simple and can withstand gale-force winds. The beans often outgrow it and form a fringe over the top, but that isn't a problem. Once the season is over and the beans are harvested, the biodegradable teepee can be put on the brush or compost pile.
- **Flowers.** The colour of the gorgeous blossoms ranges from scarlet to salmon to white; they are definitely one of the most spectacular garden flowers. They're also edible. What makes the flowers even more beautiful is how they attract hummingbirds. When I work in the garden near the runner beans, I constantly see and hear hummingbirds buzzing about. You play an important ecological role by planting runners. The flowers provide food for many wild pollinators, including bumblebees and hoverflies (which consume aphids and other garden pests).

Rank	Variety	Heirloom?	Blossom colour	Height	Yield	Colour of beans	Comment
1	Sadies Horse Bean	Yes	Certain flowers were red, others white and the rest were both red and white	10+ feet	Extremely high	Variable	Overall best bean
2	Black Coat	Yes	Red	7 feet	Very high	Black	Excellent and earlier than the others
3	Celebration	No	Salmon	10+ feet	Very high	Purple with black markings	Very long beans
4	Aintree	No	Red	10+ feet	Good	Tan with black specks	Very long beans
5	Scarlet Runner	Yes	Red	10+ feet	Good	Purple with black markings	Very vigorous climber
6	Scarlet Emperor	Yes	Red	10+ feet	Fairly good	Purple with black markings	Similar to Scarlet Runner
7	Sunset	Yes	Salmon	10+ feet	Mediocre	Purple with heavy black markings	Good climber
8	Painted Lady	Yes	Red and white on each blossom	7 feet	Low	Purple with black markings	Beautiful blossoms
9	White Half Runner	Unknown	White	Some plants were 3-4 feet tall; others were 8 feet	Low	White	A bit earlier than others (except for black coat)
N/a	Pickwick Dwarf	Yes	Red	2.5-3 feet	Good for its size	Purple with black markings	Suitable for containers; otherwise beans touch the soil.
N/a	Dwarf Bees	Unknown	Red	2.5-3 feet	Good for its size	Purple with black markings	Suitable for containers; otherwise beans touch the soil.

• **Beans.** The beans can be used at three stages. Young pods can be eaten like green beans. If they're large (i.e., 8-12 inches long), take the time to remove the strings at the sides of the pods. As soon as you notice the beans starting to swell the pods, these will be too tough. Then it's time to wait for the beans.

Once the beans fill out the pods, you can shell them (like peas) and use the fresh beans. Cook these and use them in bean salads or any recipe that calls for beans. Whatever you don't use in the summer can be left to dry on the vine. With 7-10 large beans in a pod, it takes only a few minutes to shell enough for a meal. Dried runners are great for winter soups, chilis and stews. I treat them like other dried beans by soaking overnight, changing the water in the morning, bringing to a boil and then simmering until tender.

## Varieties

Compared to common beans, there are not many varieties of runner beans. Many seed companies will just sell one or two types (and one will likely be Scarlet Runner). It's worth search-

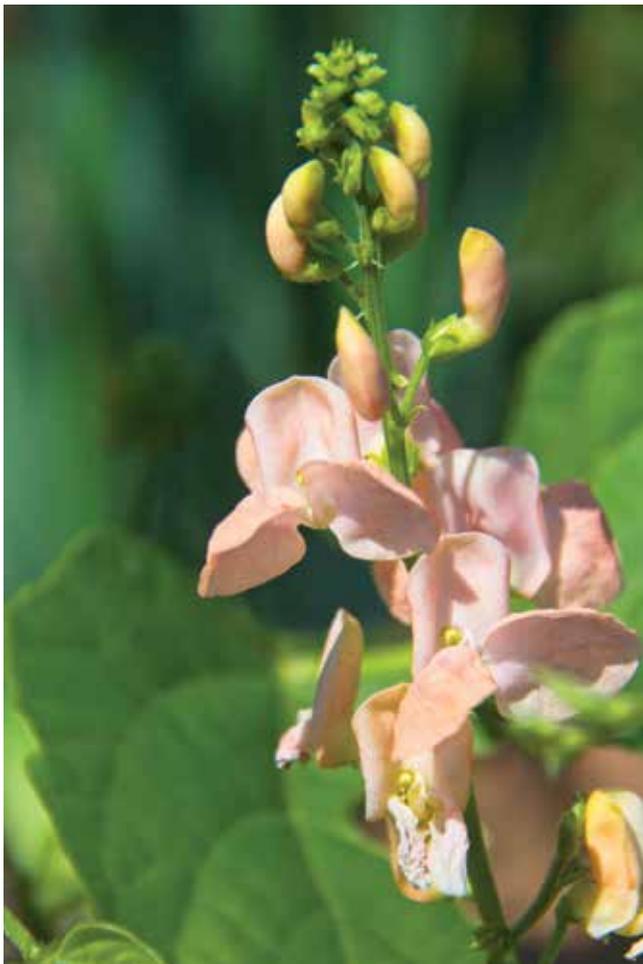
ing for other varieties to bring more colour into your garden. I compared 11 varieties of runner beans for *Small Farm Canada* that were available from Canadian seed companies. If you want to find more runners and more modern varieties (bred to be productive and stringless), check out British seed companies. To find Canadian sources of the following (and other runners), visit the Seeds of Diversity's seed finder ([seeds.ca/seedfinder](http://seeds.ca/seedfinder)), search for Runner bean (under 'R' not under 'B' for beans).

## Performance

Ranked from my favourite to (shall we say) least appreciated:

**Sadie's Horse Bean** had high yields of tasty beans. Both the beans and the flowers have a range of colours and patterns. It is a highly productive variety, said to have been saved by a family in North Carolina for more than 100 years. If you try to find seed for this, be sure you're planting a runner bean. There is a variety of common bean with the same name and, just to confuse things, the term 'horse beans' usually refers to fava (broad) beans.

*continued on page 30*



Modest producer Sunset.

**Black Coat** dates back to at least 1654. It has deep red flowers and is a bit shorter than most of the others. This variety matures before all the other contenders in the trial—a particularly valuable trait if you want dry beans and have either a short season or wet falls. Black Coat has smaller pods with fewer beans per pod. Nonetheless it produces a heavy crop of delicious black beans.

**Celebration** is an extremely high-yielding variety with tender green beans. It has salmon-coloured blossoms.

**Aintree** is a modern variety with stringless pods. The flowers and beans look like those of Scarlet Runner but, compared to Scarlet Runner, Aintree's pods (i.e., eaten like string beans) are more tender and the yields of pods and dry beans are higher.

**Scarlet Runners** are tall, productive heirloom plants. The beans are purple with black markings and the flowers are, you guessed it, scarlet.

**Scarlet Emperors** are very similar to Scarlet Runners. This traditional plant also has red blossoms and purplish-black beans.

**Sunset** has beautiful salmon or peachy-pink flowers with moderate yields of beans.



White Half Runner.

**Painted Lady** is another heirloom. It has multi-coloured flowers with red sections, white parts and sometimes salmon or pink sections as well. The beans are tan with dark markings. I found this to be slightly shorter than most other varieties and the least productive of the full-size types.

**White Half Runner** is a shorter variety that is said to have white seeds and flowers. The seed I bought, however, seemed to have crossed with another runner. I had some plants with long runners reaching to six-feet tall whereas other plants were short and had almost a bush-type growth habit. Also, the ones I grew had both red and white flowers. It was also low-yielding.

**Pickwick Dwarf** and **Dwarf Bees** were similar and I'm ranking them the same. The idea of a dwarf runner bean sounded like a good idea. The plants won't shade anything else in the garden and a teepee or trellis is not needed. These two varieties are highly productive given their small size (e.g., 2 feet tall).

They are both covered with red blossoms early in the season and later have many beans. The problem was that the beans were almost as long as those of full-sized plants. As a result, most pods touched the soil or mulch. The plants produced many beans that then rotted or were eaten by slugs. I have since heard that these varieties do very well in pots.



Heirloom variety Painted Lady scored well on beauty but not so well on production.



The runner bean everyone knows, Scarlet Runner.



## Saving seed

It is incredibly easy to save seed from runner beans; just let the beans dry on the trellis or teepee and shell them. It is, however, very difficult to save true seed if you are growing more than one variety (or if your neighbour is growing a different type). Runner beans are pollinated by hummingbirds, bumblebees and insects that can carry pollen a long way. If you want to save seed that breed true the following year, you should ensure there is no other variety grown within a quarter mile.

Another option is to let them cross. I didn't save seed the year I conducted the trial because I didn't want to have any of the dwarf beans contribute to the gene pool. The following year, I planted out a number of my leftover seeds from my favourite five varieties. I had a beautiful mix of red, white and salmon-coloured flowers. I let them cross and saved the colourful seed (for both winter stews and spring planting). From now on, I'll keep saving seed from my mixture of plants and selecting for the characteristics I care about, including earliness, high productivity, great flavour and tender texture.

Janet Wallace uses branches to make teepees for her runners to climb.



# PERMACULTURE COMES OF AGE

Can a growing system with high environmental principles be commercially viable?

BY VANESSA FARNSWORTH

**W**hen contemplating agricultural practices in Canada today, it's hard not to notice that permaculture, once the black sheep of alternative farming practices, has begun making inroads on small farms in this country after decades of barely registering on farmers' radars.

The term itself was first coined by Australians Bill Mollison and David Holmgren in the mid-1970s when they set their sights on developing a sustainable agriculture model that mimicked natural systems, and was less reliant on the high level of inputs that had come to dominate commercial farming.

"Permaculture tried to take a really broad sweep look at alternatives to the industrial, mass production, chemically dependent agriculture that had become dominant at the time and continues to be very dominant today," says Sarah Hirschfeld, an agroecologist whose 2017 study examining plant diversity on commercial permaculture farms on Vancouver Island and in coastal British Columbia ranks as one of the very few scientific papers to take a hard look at how permaculture's principles are being applied on working farms. "There's really not a lot of scientific literature written about permaculture and yet at the same time there's tons written about it in the grey literature."

That raises red flags that can be difficult to ignore. But despite the lack of scientific evidence, permaculture has taken off in many parts of the world, including Asia, Africa and South

America where its emphasis on perennial crops, low inputs, plant diversity and overall sustainability are seen as economic and cultural necessities. And while theories abound as to why permaculture has been slow to gain a foothold in Canada, the fact is it's only recently started picking up steam.

"I only know handfuls of people that really lay claim to permaculture farming. There's a bunch of start-ups I know now of people that I'm in dialogue with and mentoring, but there

isn't a large grouping of people in permaculture farming, and I think part of that is because permaculture got hijacked by the homestead, home garden, do-it-yourself, back-off-government people," says Zach Loeks, a second generation permaculturist who spent more than a decade operating a commercial market garden in the Ottawa Valley. "Which is one of the things that I feel a little bit disappointed about because permaculture has so much value to offer farms, but if you mention permaculture to some people they're kind of

like, 'Oh, you mean like that hippy gardening stuff.'"

Far from being a hippy concept, permaculture rethinks the way farms are designed, moving away from the dominant mass production system where monoculture crops are grown in ways that make them easy to mechanically harvest towards a system that organizes diverse crops into zones in which the plants that require the most attention, such as annual vegetables, are located closest to the locations where they will be processed,



Longtime permaculture advocate Ken Taylor.

*continued on page 34*





*“Permaculture tried to take a really broad sweep look at alternatives to the industrial, mass production, chemically dependent agriculture that had become dominant at the time and continues to be very dominant today.”*

Agroecologist Sarah Hirschfeld studied plant diversity on commercial permaculture farms

packed or stored and those that need less attention, such as orchards, are planted farther away.

“You do everything in a way that makes sense if you aren’t going to rely on mechanical harvesting or chemical pesticides to help you out. Because it does become labour intensive when you’re using organic methods. So the zone system has a lot to do with labour efficiency,” says Hirschfeld. “Let’s separate our crops out so that they make sense on the landscape.”

Permaculture’s emphasis on incorporating a diverse selection of permanent crops such as fruits, nuts, berries and perennial vegetables and herbs, often planted in complementary groups known as guilds, should come as no real surprise considering the word “permaculture” originated from the contraction of “permanent” and “agriculture”.

“So it’s perennial agriculture. Trees and shrubs and perennial crops,” says Gregoire Lamoureux, founder of the Kootenay Permaculture Institute. He has been operating a small permaculture farm in BC’s Slocan Valley since 1991 and knows well the dedication permanent crops require. “To be in this climate and to want to grow nut trees is a long-term investment. With veggies it’s easier to rent or lease land. You can move around. Pack your bags and save your seeds and try again somewhere else. But with fruit trees, nut trees and all of that, it’s more difficult so you have to have a bit of a longer term commitment to the land.”

Indeed Hirschfeld’s study showed that on the 10 commercial permaculture farms she took a close look at, perennial food crops were not only present, they far exceeded annual crops in both species richness and abundance. No farm she surveyed was limited to a single dominant crop and a mix of fruits, nuts and vegetables was found on all sites which, she notes, makes perennial crops more common amongst permaculture farms

than what you would typically find on conventional farms in the region.

“I definitely found a preference for perennials among permaculture farmers,” she says. “That was one of the findings in my study. And I wanted to substantiate that because one of the very first publications praised permaculture as an exploration of perennial agriculture. The idea was that perennials would be permanent crops versus annuals that you’re ripping out of the ground every year and that has a lot of ecological consequences. It’s also very labour intensive.”

This is something that Zach Loeks understands well. Although raised on a permaculture homestead in New Mexico, Loeks began his career in commercial agriculture as an organic market gardener, but after a few years in operation he found that something wasn’t sitting right.

“The process of market gardening and the growth of market gardening is one where you really quickly get caught up in an annual cycle. And you’re like ‘Okay, I’ve got to get the ground open. I’ve got to seed it and harvest it and sell it and buy more seed.’ It’s easy to get tied up in that and to constantly invest in things that don’t really help you and your soil in the long term,” he says. “I noticed that there were problems with the land, with the soil and so I got back to my roots, so to speak, and started to see how I could incorporate what I grew up with in terms of permaculture design: integrating perennial and annual food systems, maximizing soil health and seeing how that can fit into a busy profit-oriented farming career.”

Loeks soon began to transition his market garden so it was more in line with permaculture principles, incorporating perennial plants into his production fields and finding more sustainable ways of growing food crops. In doing so, he created permanent perennial beds where he planted his crops in guilds.



Gregoire Lamoureux studies a peabush.

“So where other places till in everything at the end of the year and then reform the beds, these ones stay in place,” he says. “The unique opportunity this provides is that I can take one of my beds and I can plant it in a cherry-raspberry-thyme-grape guild and it doesn’t stop me from growing a field of squash on one side and a field of carrots on the other. If I didn’t have permanent beds, it would be a logistical nightmare to do that.”

All this emphasis on incorporating perennials alongside annuals not only leads to incredible diversity but, as Loeks points out, to economic, social and environmental resilience since different crops inevitably thrive in different years. So the more diversity a farm has, the better the chances it can avoid a catastrophic crop failure.

Hirschfeld was able to confirm just how remarkable the levels of diversity are on the permaculture farms included in her research.

“I had one farm in my study where I counted 99 different crop species,” she says. “And most of the farms have multiple varieties of each dominant species. Nobody simply had an apple orchard. Everybody had apples and plums and pears and peaches all mixed in together.”

With so much diversity, it’s fair to wonder how farmers manage the day-to-day challenges all that variety can bring in terms of having the equipment, skills and labour available to manage those crops.

“One of the problems that can occur is spreading yourself too thin. Everything on the farm costs money, time, energy, investment. Skills have to be learned. This is one of the difficulties of diversity,” says Loeks. “So a big question for me was how do you increase diversity, which increases resilience in case one crop has a bad year, without increasing management?”

One solution Loeks came up with was integrating annuals and perennials in raised beds that are never destroyed. “I may reform them by taking past material and applying it to the top of the bed, but I’m not actually ever going in there with a plow or a disc or a cultivator,” he says. “So I’m able to gain familiarity with the bed and its unique situation within the environment of my fields and the microclimate of that part of the field.”

Loeks acknowledges that while conventional farming tends to be profit-oriented and annual-oriented, permaculture can sometimes err on the side of being too diversified, even unfocused, and he fears that could result in the practice becoming a relic before it ever reaches its full potential.

“So I want the permaculturist to be more organized, more profit-oriented and more focused,” he says.

Ken Taylor, owner of Green Barn Farm in Notre-Dame-de-l’île-Perrot, QC agrees. He thinks permaculture tends to bog down in philosophical concepts like establishing butterfly gardens or riparian strips that aren’t always practical on commercial farms.

“When we talk about commercial permaculture, you’ve got to show some bottom line or you might as well say your farm is a park or something else that’s an infinite money drain,” says Taylor, who has spent his career developing cold-adapted, pest and disease resistant fruit tree varieties on his permaculture farm. “I basically set it up so that the genetic species I want — which are food producing fruit trees, bushes, shrubs and groundcovers — could be integrated in a fashion that was labour-reduced, spray-reduced, input-reduced to the point where I basically have a food production farm without any of the traditional inputs that you’d have to do for a conventional farm. And the good thing about it is I can pull in \$100,000 a year selling the product without any effort.”

Taylor sees climate extremes as being the biggest challenge facing budding Canadian permaculture farmers wishing to incorporate perennial crops on their farms.

“You need to find something that’s hardy and that you’ll be able to grow on Edmonton area farms or up in Fort McMurray or Flin Flon, Manitoba,” he says. “Ask yourself, ‘Is it hardy? Will it adapt to my colder climate and to the hot summers? And will it also adapt to all of the moisture I tend to get at certain times of the year?’”

For his part, Lamoureux has this advice for farmers contemplating permaculture: “Learn more, learn all you can about it and start small. Different places will bring different challenges. Take a whole year or a whole season to observe the land before making a big move and ask yourself, ‘What are my resources? What are my challenges? And how can I make it work?’ Give yourself some time especially when going into the transition. There could be some hiccups or challenges.”

Still, for Lamoureux, the future looks bright for permaculture in Canada.

“I think we’re still early. We’re still studying and developing the system,” he says. “We haven’t really reached all the possibilities. I think there’s a lot of room to learn more, to experiment, to multiply and to find a way that we can manage.”



Blueberries and walnut trees grow side by side at Gregoire Lamoureux’s Kootenay Permaculture Institute.



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A day or two without power won't cause much distress. But you'll want to be prepared for an extended outage.

# LIGHTS OUT!

## Power outages are never welcome. But there are ways to lessen the inconvenience

BY CARY RIDEOUT

Next to saying the mortgage is due few words have such impact as *The power's out*. Blackouts seem longer and more frequent these days with rural areas often the last to get service restored. But with country ingenuity, resource management and planning it is possible to comfortably wait until the switch gets flipped back on.

### Dark and smoky

Food, water and shelter are never as important as when the lines go dead but fortunately our rural past is ready to help with today's blackout problems. To cope with an extended period of powerlessness every smallholder ought to consider that underground pantry of yore — the root cellar. A well-constructed properly stocked root cellar can guarantee a stretch of no groceries won't break you. A common misconception is that root cellars are just for vegetables but home canning, dry goods and even bottled liquids can slumber comfortably underground. Be sure to make yours bigger than needed. As far as designs, use imagination and muscle. A spacious root cellar could also be a haven for neighbours with produce and nowhere to keep it in a long term outage. Worth considering before the darkness sets in? You bet!

No root cellar is complete without a smoke house and our grandparents put up a year's worth of meat by salting and smoking. While a basic smoking device can be store bought, you could also design your own. Preserving meats by smoking isn't complex, but closely follow safety guidelines. And don't be like many old timers and burn the smokehouse down!

### Rotation key

Getting three meals/day can be rough on the cook once the kitchen goes cold, so why not fall back on the glass from the past? Large scale home canning is labour intensive but should the lights go out you'll be smiling at the hard work as you spoon out supper. Canned meat is excellent and since it is already

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Homemade preserves and a well stocked pantry, with products rotated from time to time, will ensure that you eat well when there's no travelling to the store.

## Power up Using generators to supply electricity

Everyone today is hooked on electric power and if denied our fix we soon get grumpy. A generator will certainly help, but fully understand your electricity needs first. Calculate your maximum power usage and then buy a model that exceeds this number.

Camping generators are fine for light duties but never should be expected to run a household. Large standby models crank out plenty of electricity, and for anyone serious about maintaining power it's the choice. Cash wise, more power will cost you and don't forget the gas when calculating your purchase. One caveat about powering your plantation is you will need a separate breaker box so this has to be factored in as well. Easy on gas and steady, a quality generator can sure take the pressure off in a dim barn or dark house.

Another possible alternative power option worth considering is a stationary engine. These simple engines offer countless power options and for anyone with mechanical ability are a joy to operate. Reliable and able to digest various fuels, a well-tuned stationary engine can produce steady efficient power. Original models are still common but modern power plants can be purchased for a reasonable cash outlay.



Light, sound and fire cover necessities and comfort.

cooked it's wonderful for a no heat feeding of the crew.

Stocking up on long storage life foodstuffs like cans or dry goods always makes sense; prepare an area that is cool, seldom bothered and has enough space. Anyone super serious might look into the hiker or military meals now available, but remember during any crisis you are under pressure and that might not be the time to have exotic fare. Stick to the regular diet and your mood will be steady. Deep freezers are easy to fill and convenient but once the dreaded 48 hours of food safety passes, what then? Use freezer food storage with an eye on what might happen and consider generator power to keep the ice cream cold.

Any emergency power outage supplies must be regularly rotated and replaced. In a long darkness situation you have enough on your plate without worrying what's on the plate! I simply mark the calendar spring and fall to do a check of all items and yes it is work, but the kind that pays. Anything that is close to running out is replaced and used up. Rotation also is needed for batteries, petroleum supplies, and items like lamps or generators should be examined yearly. Store fuels in good clean sealed containers

with stabilizer added. After six months swap for fresh and use the old fuel up right away. Stock up, store and rotate. Simple and safe!

### What about water?

Regardless of the duration of the power outage you and the livestock are going to need a steady water supply. Buckets look great in a movie, but get old real fast especially if water is a mile off. So, how to get water?

If you're existing well isn't overly deep how about a hand pump? One can be installed quite reasonably, fit beside your existing pipes and pull 20 ounces per stroke. Do some prep work on your well depth, daily usage and compare this to manufactures recommendations. Many are for shallow wells but models pulling up to 150 feet are available. Another bygone barnyard fixture, the well house, will make the water job easier, keeping debris off the pump, and can be insulated for winter.

Speaking of water how about the toilet? Well, many homesteads are now equipped with an outhouse and some pretty awesome designs are gracing rural landscapes. In a blackout a basic outhouse will suffice. Remember to consider the distance walked, weather and worst case scenario. Will your backhouse creation stand the stress of you, well, under stress?



Old technology. Say no more.



Weather extremes can only lead to more disruptions.



## Cold beans and dull silence

During troubled times a crackling wood fire satisfies both spirit and stomach. Once considered quaint, the iron kitchen stove is roaring back in vogue. Quality modern wood ranges cost serious coin, might require a designated area and take some getting used to when using. But like any power outage tool they will be appreciated when needed!

Along with wood ranges there are options like propane or gas camp stoves. These are clean burning, providing large cooking surface in a manner modern cooks recognize. The only trouble is they are for outside use only and in many situations the outside is not where you want to be in a blackout. But if you have a protected area and don't mind lugging the china outdoors it will keep the pancakes coming.

Cell service is sketchy in rural Canada and worse during any power outage but you're never alone with the old-fashioned telephone. How many times have you relaxed with relief to find the land line dial tone humming, awaiting your wishes? Even in power outages the faithful land line still works and if you don't have one the neighbors do, and would expect you to come use theirs.

Speaking of communicating, once the cell towers quit you can fall back on the two way radios resembling a walkie talkie (ask your grandparents!) or CB radio to keep in contact as you survey the damage. No cell, no problem for the prepared!



A power outage doesn't have to mean cold beans from a can.

Extended periods of silence can work away at a modern person but a simple AM/FM radio playing can be reassuring. It means somewhere the world is ticking along normally and soon yours will be too. Any battery powered model is fine, and buy one for the outbuildings too.

No matter if it's plowing or pickling every job needs planning, and once the lights go out is no time to be looking for lost batteries. Long term power blackouts are unsettling, but with sensible preparation they can be successfully weathered until you hear the words "The power's on!"





# Recipes

HELEN LAMMERS-HELPS

## Nothing to eat?

### Avoiding the “Yikes, what’s for dinner tonight?” syndrome

Likely everyone at one time has arrived home hungry and tired and thought, “Yikes, what am I gonna make for dinner?” With kids back to school and the harvest season upon us, this can be a particularly challenging time to get a healthy meal on the table.

I asked Elmira, Ontario, Holistic Nutritionist, Amy Sonnenberg, for some sanity savers that can keep us from reaching for unhealthy processed foods when we’re busy. Sonnenberg has made it her mission to share with others how to use food to our advantage, choosing the right ingredients to support our health. She says investing a few minutes in menu planning is your most important tool for healthy eating and avoiding mealtime overwhelm. As Benjamin Franklin said, “Failing to plan is planning to fail.”

Menu planning will not only reduce stress and help you eat better, she says, but also save you time and money.

Sonnenberg likes to plan a week of dinners at a time leaving a night or two for spontaneity. This also allows for a “leftovers

night” which reduces food waste, she says. And while weekly planning is the timing that works best for her, Sonnenberg says it’s important for everyone to find a system that works for their particular situation.

Sitting down with her calendar, Sonnenberg assesses her time commitments and plans dinners accordingly. If there is a night when she knows she will be rushed to get dinner on the table, she’ll use her slow cooker. She likes to have at least five recipes for family favourites “in her back pocket.” These are meals she can make quickly and easily. A night when you are rushed is not a night to try a new recipe, she says.

To cut down on trips to the grocery store, Sonnenberg keeps a shopping list template on her computer with the foods she buys regularly already listed. She prints it out and puts it on the fridge door, adding the items she needs to buy to make the next week of dinners. There are also smartphone apps like ListingIt on Android and Wunderlist on Apple that do this if you prefer to go the digital route, she says.

*continued on page 43*

## Greek Quinoa Salad

Recipe courtesy of Amy Sonnenberg, Holistic Nutritionist at Designed for You Nutrition (<https://designedforyounutrition.com/>)

Quinoa is considered a ‘super food’ on many accounts. It is a complete protein, a great source of iron, B vitamins, magnesium, phosphorous, calcium, potassium and fibre. Quinoa cooks similarly to rice which makes it an easy dish to prepare on a busy night.

Servings: 6-8

Prep time: 10 minutes

Cook time: 15 minutes

### Ingredients

2 cups quinoa, cooked\*

1 cup cucumber, diced

½ cup celery, diced

1 orange pepper, diced

1 cup cherry tomatoes, cut in half

¼ cup olives, sliced

1 small lemon, freshly squeezed

1 Tbsp olive oil

2 tsp oregano, dried

1 cup feta cheese, crumbled

### Instructions

Mix all ingredients in a large bowl and allow flavours to blend for at least 30 minutes. The salad will keep in the fridge for about three days.

\*When cooking quinoa, it’s important to soak it for about 10 minutes before cooking. I simply put the quinoa in a



Greek salad made with Quinoa is both tasty and easy to prepare when time is short.

fine strainer in a pot of water to soak. After about ten minutes, I rinse it well and add new water to the pot. Quinoa can taste a little bitter if you fail to do this step.

# RECIPES *continued*

Keeping the pantry/freezer stocked with some basic items also makes it easier to throw a meal together. Sonnenberg keeps canned beans, canned tomatoes, and pasta on-hand. Using these items, along with frozen vegetables or whatever vegetables she has in the fridge, makes it easy to make minestrone soup when she needs a quick meal.

Other tips from Sonnenberg include:  
 -Frying up extra ground beef and freezing it in right-sized portions to add to pasta sauce.  
 -Doubling recipes for soup, lasagna and chili and freezing the leftovers in

individual-sized servings for lunches.  
 -Cooking extra and swapping with a neighbour.  
 -Preparing brown rice and a salad to serve with a grocery store rotisserie chicken. Leftover chicken can be used to make chicken salad for sandwiches or wraps and the chicken carcass can be used to make stock and chicken soup.  
 -Cutting up veggies for snacks or a stir fry ahead of time.  
 -Cooking quinoa to go with a meal, then using the leftovers to make this Greek Quinoa Salad for the next day's lunch.



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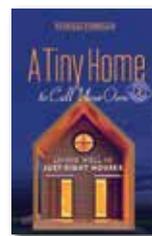


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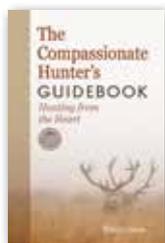


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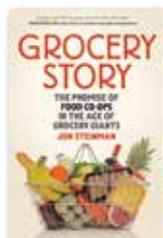


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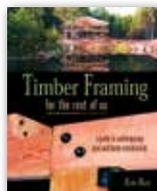


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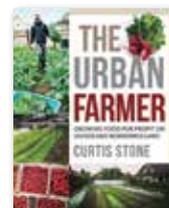


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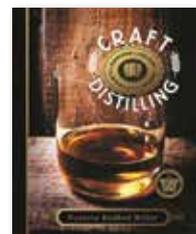


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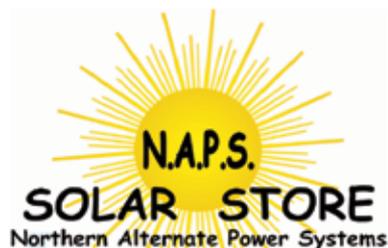
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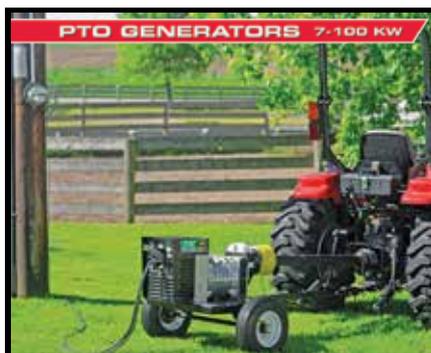
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## Small Farm CANADA

April 2019

### Could your birds make you sick?

Five risks that can live in your coop. It sounds so easy at first: get a few chicks and build a shelter in the backyard. Who would think that along with these cute little balls of fluff can come a range of health risks that can not only impact you, but also your family and the poultry world at large? Poultry can seem so ideal for rural life that it's easy to overlook the health implications that come along with our feathered friends. Whether you're keeping a couple of hens for eggs or raising 3,000 meat birds, the health risks are the same, and care should be taken to prevent the spread of disease that can affect all humans, and especially children.



### String theory - The many uses of rope

It sounds so easy at first: get a few chicks and build a shelter in the backyard. Who would think that along with these cute little balls of fluff can come a range of health risks that can not only impact you, but also your family and the poultry world at large? Poultry can seem so ideal for rural life that it's easy to overlook the health implications that come along with our feathered friends. Whether you're keeping a couple of hens for eggs or raising 3,000 meat birds, the health risks are the same, and care should be taken to prevent





# Notes from the Larkspur Supper Club

DAN NEEDLES

## If you have livestock, you will have dead stock

It's been a tough week here at the farm. Bobcat Ransier made several trips out with his backhoe to plant three members of the sheep flock. One expired as a result of misadventure and two others succumbed to the effects of a mysterious parasite.

Bob shut the machine off after the final excavation and paused to do some bereavement counselling. "Do you want to check around the place before I fill this in?" he asked.

When my father-in-law presented me with my first six sheep as a wedding present 31 years ago he warned me that they had an alarming instinct for self-destruction. But they still catch me off guard.

I assured Bob there was no plague going on. You can't do anything about an old sheep who is determined to jam herself halfway under a gate and it's a tricky thing to spot certain parasite problems in time to take action. I've already dosed the flock twice this summer for roundworms, corkscrew worms and liver fluke on top of the usual 9-way booster vaccination and a drench for coccidiosis.

"It could have something to do with the age of these animals," said Bob. Coming here is like going to the Legion. Maybe you should invest in some younger stock."

He may have a point. In a well-run sheep flock the older ewes are supposed to be culled, usually by the age of ten. But I find it difficult to fire an old sheep off to the works after she has cranked out eight or nine lambs for me. It just doesn't seem right or fair. This is a fatal weakness in a shepherd and I think one of the reasons that people prefer to run a thousand sheep at a time, rather than twelve, as I do. You don't get attached.

When I was a kid you didn't have to do much with a sheep besides dock the tail and maybe soak it with a tick spray once a year. Now a sheep gets dosed and drenched and vaccinated for a host of different ailments. Even then they still think up creative ways to die that I have never heard of.

Some years ago I came into the barn and found Cinder, the black ewe, lying down and staring straight up at the ceiling, apparently fascinated by the light bulb above her. I realized she was in some kind of a spasm so I loaded her onto the back of the truck and drove her into town to see Dr. Jim, who wasn't doing farm calls any more. I stopped at a red light and noticed people looking at the sheep and then looking up in the air to see what she was interested in. Dr. Jim diagnosed sheep polio.

"Sheep polio?" I said, alarmed. "I've never heard of polio in a sheep."

"That's the thing," said Jim. "You've only had the sheep for twenty years and you only keep twelve.

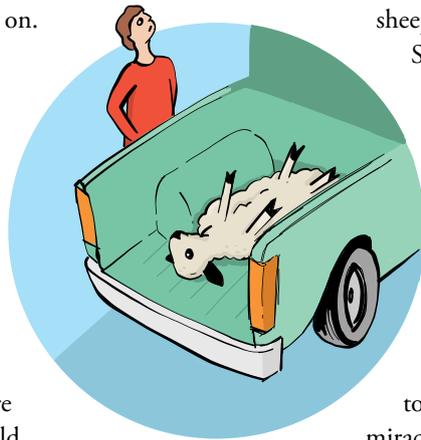
So you're always going to see something new.

There's more than 250 things that can go wrong with a sheep. You're not even halfway there yet."

Sheep polio is caused by a thiamine deficiency, not a virus. Jim was very surprised when I got a handful of off-label thiamine needles from a friend at the hospital (they use it for treating severe alcoholics) and succeeded in bringing Cinder back to health. He actually dropped by to look at this miracle sheep that had defied the odds.

"She's okay but she'll probably have some brain damage," he warned. I forgot to ask him how you would tell if a sheep has brain damage. But sure enough she seemed to suffer a serious short term memory loss. Hay was always a complete surprise for her after that and she often came up from the pasture and stared at the barn as if to say, "Who put that there?"

Cinder lasted another couple of years and produced two more lambs but I made the mistake of allowing a portrait artist to set up in the barnyard and fashion an oil painting of her. I find this is almost always fatal for an animal. Within a month Cinder figured out a way to hang herself in a gate she had lived beside for a decade. She now hangs in the hallway outside my office, a testimonial to long service and a tribute to imaginative and inventive ways to exit this world.





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