



“Agriculture is in the crosshairs of society, so it’s important we have people who are willing to stand up, articulate our position and speak positively.”

Conversations with Blake Vince

Roots not iron

CPM meets the creator of the #rootsnotiron hashtag, Canadian cover crop pioneer Blake Vince to talk cover crops, water, nitrogen prices and the role of livestock on his farm.
By Mike Abram

There’s no question that a Nuffield Farming Scholarship brings the participant, and agriculture more widely, some breakthrough moments. For Canadian farmer Blake Vince that happened at a field day in Ohio.

Blake was visiting to look at machinery but came away with a more striking memory after an encounter with Dave Brandt, “the granddaddy of cover crops”, as Blake describes him, in a soil pit.

“He called me over and said: ‘I can do more with roots than you can with that machine,’” recalls Blake.

Summer cover crops planted in June on David’s farm were over the hood of a tractor in August highlighted his point, and Blake came away convinced this was something he needed to implement on his 486ha

farm bordering the Great Lakes in southwest Ontario.

Finding solutions

Two other factors were also important at the start of his cover crop experimentation. Firstly, economics. Margins were being eroded and he saw the use of cover crops as an opportunity to further reduce fuel use by fully switching to no-till from a hybrid system, that also included some strip-tillage.

“My thoughts were if I can get this system perfected and use roots to open the profile of our Brookston clay soil, and fix nitrogen biologically rather than purchase it, I could save some costs.

“But what really compelled me was a photo of Lake Erie showing problems with blue-green algae blooms created by agricultural run-off. I knew agriculture was part of the problem and I wanted to be seen as part of the solution, not the problem.”

A Nuffield Scholarship followed in 2013, along with the phrase “roots not iron” — which he created and helped popularise as a social media hashtag #rootsnotiron. Nearly 10 years later, as current chair of Nuffield Canada, he’s widely regarded as a pioneer in incorporating cover crops into arable rotations.

“Nuffield allowed me to travel the world, see this methodology in practice and to develop a network of mentors. Together

we’ve learnt from each other’s successes and failures, and by disseminating that information freely, as Nuffield asks, I’ve found myself considered a pioneer.”

His initial foray into cover crops was blending and drilling easily accessible seed on the farm — radish, soya bean, peas, oats and canola. “I learnt along the way to set the opening based on the average seed size in the blend.” ▶



Blake Vince sees the future in walking the profit off the farm — as animals or customers buying produce direct.



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► No-till corn followed the cover crop, and there was no discernible difference in yield where he used the cover crop compared with no-tilled, or strip-tilled, corn without the cover.

That encouraged him to immediately start trialling 14-way cover crops blends, including six legumes, various cereals, plus sunflowers, radishes and phacelia. This was compared

with a four-species blend, a two species cover of oats and radish, and volunteer wheat, he says.

“Where we had more diversity, we had consistently more corn yield. Walking the field that summer, you could literally feel the nuances of differences in the soil as you walked across the plots,” he says.

“It felt a lot more resilient, more forgiving and alive. It was like

Water worth more than carbon

While on paper Blake should be in an excellent position to benefit from the rush to reward farmers for storing carbon in their soils, he says the schemes in North America are more interested in what he calls ‘freshly minted carbon’.

“These are people changing their practices now that have the potential to significantly increase their carbon. That lends itself to farms with soils that have been significantly eroded.

“With farmers further down the path of change, the changes you will see will be less significant as the soil is finding its equilibrium.”

It frustrates him that society is happy to incentivise change but reluctant to reward those that have already done the heavy lifting. “The whole thing is a bit farcical, with the lack of regulation. I have no interest in signing into any scheme presently, as I don’t like being tied into a contract that governs what I can do on farm.”

He suggests water might be a better target for incentives. Increased water vapour in the

atmosphere is a consequence of human-produced global warming, and effectively supercharges the warming caused by other greenhouse gases.

“If we can improve water holding capacity and increase infiltration rates, that can effectively reduce erosion, run-off, and drought. In areas that are rain-fed, that will improve productivity, helping the local economy.”

Tying incentives to water would be more visual and easier for the general public to understand than carbon. “We drink it every day, wash in it, etc. It’s an essential ingredient to life. We know the problems with water — it’s agricultural runoff, human effluent and commercial pollution.

“We can address these problems by making wholesale changes. That’s where protecting water resources would be an easier sell and allow people to get behind agricultural initiatives that tie farmers back to water quality.”



Blake believes protecting water resources would be an easier sell than carbon and allow people to get behind agricultural initiatives that tie farmers back to water quality.



Cereal rye in grain maize stover, flown on with an airplane in September pre-maize harvest 2020. Photo taken spring of 2021.

walking on a hardwood floor and then walking onto a carpeted floor. Having these living roots is a huge asset to open up and increase water infiltration and water holding capacity.”

Cover crops are now used extensively through his rotation. After corn, cereal rye is broadcast into the standing corn stocks in October or November — a single species is used as typically not much else will grow and survive the winter.

Soya beans are direct drilled into the rye ‘on the green’, which keeps weed populations in check — important as Roundup Ready (glyphosate) resistant weeds are an issue in the region.

In year two, after soya beans are harvested cereal rye is direct drilled into the stubble. “We direct drill into soya bean as the stubble doesn’t provide enough shelter to protect that young seedling, unlike corn.”

After a second season of soya beans, winter wheat is no-tilled post-harvest. “The wheat is typically harvested in July and, following that, I plant the big diverse blends, usually of 18 species.”

Around 5-6 species survive through winter — cereal rye, crimson clover, hairy vetch, peas, purple-topped turnip, and possibly a trace of linseed. “I then usually direct drill corn into a big green living cover in the spring.”

But the past summer he started working with a grazier

with a small suckler herd to graze some of these covers to cycle nutrients and he’s already excited about the extra environmental benefits. “I didn’t anticipate the return of some birds of prey, some other songbirds typically found in grassland habitats, and even some amphibians in such short order.”

Livestock benefits

It’s the first-time livestock have been on the farm since around the time the farm converted to no-till in 1983. At that time rising inflation and lower commodity prices, including beef, prompted his father and uncles to prioritise arable farming and close a small beef feedlot, while a dairy herd was sold in 1974.

“The biggest advantage of having a grazing ruminant is you get the beneficial microbiology that comes in the faeces, urine, mucus, and saliva back into the soil and that helps complete the relationships.

“I think we’ve done a huge disservice by removing animals from the land. Manures and animal interaction with the soil is critical. With fertiliser prices having risen, I think animal husbandry and access to manures, providing you can feed those animals profitably, will be a huge asset to the bottom line.”

Like many in North America, Blake didn’t have any fertiliser secured heading into spring planting — that’s going to mean ▶



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The biggest advantage of having a grazing ruminant is putting the beneficial microbiology that comes in the faeces, urine, mucus, and saliva back into the soil.

▶ a significantly different fertiliser strategy this season.

Prior to the Ukraine war, he could see the NOLA (New Orleans, Louisiana) price softening and was holding off buying but, coupled with selling winter wheat forward on prices that have now increased dramatically, he's on the wrong side of both markets. "It's a bitter pill to swallow."

Any bought-in fertiliser will be used very judiciously, he says, but he's also hoping that non-grazed mixed species cover crops grown before corn will help provide nitrogen to the crop. "The concept of plants helping each other intrigues me, and while I can't expect to have the same physical yield, it's better to make a margin than no margin."

He's also conscious of the increase in risk this spring, which could well be a forerunner

of what farmers in the UK could face this autumn. "Farmers are on the hook for a larger sum going into spring planting. If our line of credit is maxed out to buy fertiliser, seed, herbicide and fungicide and we don't come up with the yield we're expecting because of drought or a hailstorm, what happens if you're short of crop? We're exposed and that's concerning."

"We're handling a lot more money, which would be one thing if we could stand to profit more but that isn't the case, necessarily."

Non-GM varieties

Blake grows non-GM corn and soya beans.

"I'm not interested in the latest traits as I have a focus on soil health and a good rotation. I'm not growing corn after corn, or just alternating corn and soya beans, so I don't need insect protection or herbicide resistant technology."

Premiums for non-GMO corn are typically harder to find than for soya beans, and earlier in spring both failed to increase in line with increasing commodity prices, further adding to risk, particularly for corn where non-GMO yields are typically 5-7% lower.

"One of the motivational factors to grow non-GMO was that farmers are producers of food, and yet when I was growing GM crops, corn was for ethanol, soya beans for biodiesel and plastic."

"With non-GMO at least I'm back to producing food. The soya beans go to make

tofu and miso, while the corn is being used for non-GMO Canadian Club whiskey."

His soft red milling wheat is milled for flour to use in doughnuts and cookies. But the future, he hopes, is to "walk" the profit off the farm. "By walking it either has to have hooves or be people coming to the farm to buy direct. That helps you capture more value."

"When I look at the millions of people who live within an hour away from my home, notwithstanding the border and the current high fuel prices perhaps discouraging people from travelling, I see a good opportunity to find products to direct market."

"That's why I keep coming back to beef. I think there's a vast segment of consumers that will demand animal-based protein. If beef is raised in a system they can appreciate and respect, the story will be an easy sell. That was evident the minute I put cattle back on the landscape with the comments I got from people, including wanting to buy the beef."

"It made me realise people do pay attention. The same with the cover crops — the questions I receive come from people from non-farming backgrounds."

"Agriculture is in the crosshairs of society, so it's important we have people who are willing to stand up, articulate our position and speak positively. I think our cover crops, soil health and water initiatives are a positive story that's easy to be excited about," he says. ■

Slow pace of change in Canada

In Canada, Blake is very much the exception in his farming methods. "Farmers like me are spread few and far between. We are fought every step of the way by 'big' agriculture retailers as we're seen as disruptors to the current model."

Another challenge is that soils, at least in Ontario, are relatively "young" and haven't been farmed for that long. That means they still have intrinsic value and lend themselves to tillage, he says.

"We also have a lot of European immigrants who are used to using tillage but by using that exhaustive approach things will never get better," he claims. "They burn off more carbon and use more fuel."

It's driven by plenty of available rain, meaning preservation of water in soil is less important than in more arid areas. "We're lucky to get the rain to perpetuate their preferred methodology. But you can no longer say the farmer is ignorant — he knows the negative consequences of his actions."

"The bigger risk is indifference — how do you help the farmer who is indifferent. He's not going to listen to others, but we all share the same air and water."

"After doing my Nuffield, the people I really wanted to influence were those close to home, and that's been difficult. I've been told I'm moving too fast, but we started no-till in 1983, how much slower do you want to move?"

On his farm, he can now find up to 45 earthworms/sq ft of soil — equivalent to nearly 5 million/ha. "The depth earthworm middens, or channels, go down is far greater than any tillage tool you could buy today, and would require in excess of 500hp tractor to pull that tillage tool anyway."

He's also seeing significantly improved water infiltration rates following big rain events, combined with crops being more resilient to drought. Soil organic matters have increased from 3.5-4% to 4.8-6.5%. "It's not uncommon for neighbour's organic matters to be nearer 2%."



The depth earthworm middens, or channels, go down is far greater than any tillage tool you could buy today.

"Visually I'm seeing more mushroom fruiting bodies, so I can see our soils are changing from being bacterial dominant, which is inevitable when using chemical-based products, to being fungal dominant — which is what you find in a forest."