

Blanketing a Watershed in Deep Topsoil, in a Decade

by Ralph C. Martin

When I hear a big hairy audacious goal (BHAG) I expect drum rolls and trumpets, or if it's really big, tubas. There was not even a piccolo adagio when Abe Collins, a Vermont educator and consultant shared his passion for topsoil formation and grazing at the Ecological Farmers of Ontario Conference. Nevertheless, the audience was all ears. His BHAG? He expects a community, near Lake Champlain, to blanket their watershed in deep topsoil, in a decade.

Abe isn't wild eyed, unusually dressed or a mesmerizing speaker. His stance is solid as he shows slides of cattle, machines, crops and soil while sharing his observations about practices on his farm. Like many farmers, he notices details of changes over time. He has seen soil improve and other farmers want to know what his practices are.

One of the startling questions in his presentation was, "Are you happy with farming 6 in deep?" Not waiting for a response he said, "poor farmers grow crops, but good farmers grow soil."

With astute management of keyline plowing (search for the Keyline Plan, by P. A. Yeomans) to reduce compaction and facilitate water infiltration and by grazing as described at www.soilcarboncoalition.org, Collins' farm 'grew' topsoil to a depth of 46 cm contrasted with an adjacent set aside area of 13 cm. He claims a sub-soiler can buy decades on compacted soil by plowing deeper, with each pass, as moisture seeps deeper, soil microbes go to work and grass roots explore deeper soil volumes.

Collins thinks at a watershed rather than a farm scale. He explained that it is cheaper for New York City to pay for preventative water management programs in the Catskills than to pay direct costs of curing polluted and variable water flows. "Topsoil cleans water. Therefore, let's grow more topsoil," urges Collins.

A regional watershed approach could enhance benefits of social, ecological and economic goods and services. The impact of alternative agriculture is diluted when uniquely managed farms are "islands" among large areas of farmers without commitment to such management.

A landscape demarcated by the limits of a watershed provides otherwise unavailable opportunities to identify interactions among bio-physical factors, such as soil erosion and water quality. By concentrating expertise, materials and services required by farmers with alternative practices and by branding products from this watershed, there could be opportunities for improved sales. Such a watershed could also be appealing for tourists seeking a clean vacation.

As an excellent grazer, Collins manages his cattle to graze at the right time of grass growth, in exact amounts, with plenty of forage residue to feed soil. Details of his excellent practices tumble from a mouth, which never seems fast enough for his mind. Regardless, he decries any one best management practice (BMP) as a primitive relic. “Monitor the outcomes,” he invokes, “in order to learn faster.” These are not the words of a hokey cowboy.

Abe is convinced we can all do better than BMPs with a real-time dashboard on each farm. Just as some dairy farmers with voluntary milking systems can view monitors with individual cow milking times, milk yield and health status, he imagines soil growing farmers regularly checking real-time environmental feedback to land management, with a sensed landscape, to measure soil organic carbon, soil aggregate stability, soil moisture content, other soil characteristics and weather.

If precipitation can infiltrate into soil with minimal runoff and emerge in streams as clean water, then soil is well managed, according to Collins. How would sensors on devices such as infiltrometers and penetrometers (to measure compaction) work automatically, on an ongoing basis, at a reasonable cost? That’s a challenge for instrument technologists and his computer and big data colleagues. The synergy of healthy collaboration is to engage people with varying perspectives and skills. Engage them he does.

The social implication is that farmers will be empowered to make local decisions to grow soil, improve water quality and to adapt to the variability of climate change with management that is responsive to what happens, as it happens. Is this what farmers want? It could be their opportunity to sustain soil and crop systems and reverse trends that are keeping them up at night.

Abe told a story about an old man in Australia with considerable business success who told him “the biggest accomplishment of my life was to build soil with a keyline plow.” Many farmers, especially those who have walked and worried on land since their birth know their land beyond the calculations of any realtor. Some have heard stories from parents and grandparents

and about ancestors who also formed and were formed by the same landscape, and they want to do right for their land and their descendants.

Will Abe Collins succeed in his BHAG? I don't know. If not, there will still be improved soil on some farms. If he does, let the tubas play!

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