Presentation: Innovative Ideas on Small Plots

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I have been working in commercial organic vegetable production since 2003, and since 2009 have been the co-owner of Pitchfork Farm, a 12-acre diverse organic vegetable farm on the Intervale in Burlington Vermont. We primarily produce mixed veggies for direct sales to restaurant customers in Burlington (maybe 90% of our revenue), and we operate a small CSA. This last summer we began experimenting with on-farm events—I'm always eager to add new enterprises to the core farm business.

In the off-season over the last ten years I have worked in metal fabrication shops and for industrial design firms. I've been fortunate to have had the opportunity to participate in a really diverse array of projects, from welding on industrial cranes, to building art sculpture installations at music festivals, to designing custom lighting fixtures with budgets of tens and even hundreds of thousands of dollars.

Over the last two years I have been turning my attention to growing my own agricultural design and fabrication business, **Upstream Ag**. I've done simple projects like wheel hoes and bare-bones three-point hitch toolbars for customers, I've welded bent aluminum irrigation pipes, performed lots of repair work, and I've also started doing more complex projects like tractor mounted flame weeders ignited remotely by digital microcontrollers. (Man, that flame weeder was sweet. We don't even have one that nice on my own farm, you can flip the flame on with a switch at the beginning of the bed and flip it off at the end without getting out of the tractor seat.)

I came to farming deliberately—the moment I realized it was an actual thing that you could do, I knew that I wanted to do it—but I came to design a little bit by accident. In 2006 a colleague and myself applied for and were awarded a SARE grant to build and test a pedal powered prone workstation of our own design. The concept was simple enough: Two operators working in the prone position were able to advance over a production bed generating forward momentum using only human power. The operators would be able to hand weed, pick crops, transplant, etc.

It was the first time either of us had encountered a formal design problem, and as we worked through the project we were able to instinctually uncover many of the techniques used by professional designers – carefully attempting to define the problem, prototyping, iterating and refining. We taught ourselves rudimentary metalworking in the process, and in the end we were able to realize a somewhat functional prototype. We had a blast doing it. I was, to say the least, hooked.

A decade later I have remained deeply interested in designing for the small farm. I've become a skilled metalworker (lots of people tell me they want to learn to weld, but let me tell you welding is only one small part of metalworking), and I've learned a lot of other interesting skills along the way. Many of the projects I've been working on this summer for my own farm have required major software components. For example, I coded an application that functions as an add-on to Quickbooks that allows me to print packing labels directly from our invoices. As I'm writing this I'm realizing that doesn't sound very impressive, but the novelty is that the app parses the quantities of each item on each invoice and produces labels for each carton, based on how we actually pack the crops. 48 count of bunched radish is parsed to produce two separate labels stating 24 count radish each and so on. It's saved us an hour and a half of handwriting labels each week, and hundreds of dollars on commercially printed labels each year.

I have been incredibly heartened by the increases in work-flow efficiency, improved profitability, and all-around expansion of pleasure and enjoyment of farm work that can be realized with good design. I have seen it again and again on my own farm, and for the farms I have designed solutions for. In 2013, thinking back to the original SARE grant that got me started in 2006, I decided to design my own take on an electric powered version of the prone workstation. I had seen a handful of examples of this machine, but I didn't think that they were really optimized for small scale organic vegetable production – they were either too big and bulky, making them difficult to move around quickly to different plantings, or they could accommodate only a single operator (my deepest sympathies to anyone who does a lot of hand weeding by themselves for hours at a time). I wanted the machine that I would use on my farm.

After building a couple of prototypes I was totally amazed by the way the prone weeder completely changed the rhythm of the farm. This last winter I brought the machine through the entire design phase to marketable product, and it went into production after my first exhibition at an ag conference.

At this point in my career I would say that I am hell-bent on bringing to life the next generation of appropriate technology for the kind of farming that we have all been working so hard to help take root in the world around us. I have my eye towards technology that will increase the profitability and resiliency of our farm businesses. There are new and powerful tools, materials, and processes available to the designer today that didn't exist ten or even five years ago, and the next generation of tools will follow. I will speak on the panel about my work, how I see design and design skills fitting into agriculture today, and my hope for the future of small farming.