

Durable Production Tools

Matt Hagny is a consulting agronomist for no-till systems, based in Salina, KS.

by Matt Hagny

P E R S P E C T I V E

Are your production tools getting more or less powerful? —This is the ‘thought experiment’ proposed by rangeland specialist Kirk Gadzia. And a useful one it is. If you know that a technique is weakening, a prudent manager would be searching intensely for a replacement method, or looking for ways to shore up the shaky scaffolding of the old—if only to delay the collapse.

Modern cropping agriculture makes use of a wide array of yield-enhancing tools. But like the wooden spears of a tribe who has hunted most of the local large animals to extinction, some of our tools just aren’t very effective anymore.

Take herbicides for instance. Not only are we getting a considerable number of weed species resistant to various chemistries, but many are just getting more and more *tolerant*. Remember when atrazine first came out? In the early years, it controlled many annual grasses (foxtail, crabgrass), as well as velvetleaf, Venice mallow, and many other broadleaf weeds. Nobody counts on this chemistry for even so much as suppression of those species anymore. It’s really not resistance, since 2X or 3X rates would probably do the trick—you’d be back (at least close)

to a level of control like we had 25 years ago.

The same is true of SUs, acetamides, and many other products that are used repeatedly in the same field or nearby fields. In the first few years of use, you got great control at rate X, consistently, or even $\frac{3}{4}$ of X. Now you only wish you could see that level of control again, even at 1.5X. (Herbicide labels and company reps often creep the recommended rates up over time, to compensate for the reduced efficacy.) Even if the price of the herbicide drops accordingly, you are still worse off—less weed control, more risk of crop injury, more product to handle, potentially more off-site impacts, etc. We’ve become reliant on a steady stream of new chemistry families being introduced. We no longer control our destinies.

Insecticides and fungicides are the same. It’s an arms race, and one that often proceeds even faster than the herbicide race. Repeated use of these pesticides often quickly leads to resistance in the target species. All are stopgap measures—much like the legendary duct tape or baling wire “field expedient methods.” Workable short-term patches, but you wouldn’t want to run the whole

season on them. Another analogy: Once you start hunting pheasants with shotguns and dogs you begin to select for those that run versus those that fly to escape. The pheasant has not become resistant or tolerant to the shotgun, but the shotgun is not as effective as it was initially.

Tillage, too, is a tool that is weakening in its effectiveness.

Once, tillage

Many pests have escaped extinction by rotation—and they will only get better at playing by your new rules.

was highly successful at releasing nutrients locked up in the prairie’s soil organic matter. The first generation of agriculturalists grew abundant crops on these soils—without fertilizers—and with only a modest amount of shallow tillage. As the soils got mined out, the conventional wisdom was that more frequent or deeper tillage was the necessary ingredient. Soon, summerfallow was implemented, or subsoiling (ripping), or heavier disking or plowing, depending on your location and the local lore. We now know that soil organic matter has other highly valuable functions—holding water, time-releasing nutrients, and keeping the soil in good condition. It is cheaper to buy the needed nutrients. The main point is that 100 years of tillage effectively exploited what had accumulated over eons, and there’s little left to mine.

One can also make a strong case that even fertilizers are becoming less potent. No, the analysis is the



Photo by Doug Palen.

Herbicides are a good tool to have, but each chemistry gets less effective the more it is used.