

Is Going Off the Grid Possible in the Age of Farm Data?

[Terry Griffin \(twgriffin@ksu.edu\)](mailto:twgriffin@ksu.edu) and [Alex Shanoyan \(shanoyan@ksu.edu\)](mailto:shanoyan@ksu.edu)

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The answer is: yes, but...

When asked what options farmers have regarding ‘going off the grid’ with respect to farm data, or avoiding the exposure to risk associated with farm data breaches, the tongue in cheek response usually is that farmers can (1) farm with equipment predating data, (2) not farm, or (3) limit the participation in farm data programs/activities/services. While option (1) can be viable for life-style farming, running a competitive commercial agricultural operation precludes all of these options. One reason for this is that since 2011, a substantial portion of tractors and harvesters have been equipped with telematics that wirelessly transfer data between the equipment and the cloud. Many farmers were not aware that their tractors pushed machine data back to the manufacturers (similar to how General Motors OnStar works in our pickups). Over the last five years since telematics were beginning to be placed on farm equipment, sufficient time has passed for farmers purchasing used equipment to acquire these technologies (again maybe without full knowledge of the existence of telematics).

Furthermore, “going off the grid” might not be a viable strategy as the agricultural big data system matures. In other words, “going off the grid” may put a farm in a position of competitive disadvantage. Let’s consider an analogy using an example from the industrial revolution. In the wake of agricultural mechanization, specifically with introduction of internal combustion engines and tractors in farming, concerns could have been raised by farmers regarding potential loss of self-sufficiency by adopting internal combustion engines. With animal power, farmers were self-sustaining by feeding their animals with grain produced on the farm. With mechanized agriculture, farmers gave up some of their self-sufficiency by becoming dependent upon fuel suppliers. Thus a question could have been posed: Is avoiding internal combustion engines (i.e. farming with only animal power) in order to preserve self-sufficiency possible in the age of mechanization? The answer is yes, but a farmer would have to give up potential efficiency gains, and eventually be competed out of business by fellow adopters of tractors, albeit the adoption of internal combustion engines in farming did not come without cost. It is safe to speculate that a majority of farmers today would not trade their mechanized farm practices for self-sustaining animal power. Who gained from transition from animal power to mechanized power?



Among others, the farmer gained although not by using the same farm practices as before. The farmer was better off once modern technologies were adopted and utilized to their potential. As a result, the equipment manufacturing industry came into existence and fuel suppliers also gained by this transition.

Now, let's fast forward to data sensors, collection, and processing. Analogous discussions can be made for the data revolution as for the industrial revolution. Successful farms using data will look differently with respect to data utilization than before sensors and data collection. New segments of the agricultural industry will emerge that never existed before. Farmers will give up some self-sufficiency and control over to a supplier of products, services, analysts, and platforms. However, farms that are positioned to make the most of these opportunities afforded by farm data will be successful. That being said, not all farms are expected to survive this transition much like not all farms successfully transitioned from animal to mechanized power. Just like farms becoming dependent upon fuel suppliers, farms are facing similar issues that lead to further loss of farm data privacy and a certain degree of independence.

When we discuss farm data privacy, we often consider the concept of remaining anonymous. However, in the big data world anonymity is no longer achievable at least in the same manner as it once was. In their book on [Big Data, Victor Mayer-Schönberger and Kenneth Cukier](#) describe how even sanitized data can reveal the identity of individuals by combining additional layers of (probably publicly available) data. Given the prevalence of public geospatial data, data from USDA, and plat maps, recombining these layers with sanitized community of farm data are likely to disclose all the information that were intended to remain anonymous. The underlying point that we must accept is that remaining anonymous is no longer a viable option in modern commodity crop production once agricultural big data systems reach maturity. This can in part be considered the cost of "joining the grid" and would presumably be avoided by going "off the grid".

The underlying assumption in the analogy we presented is that there will be well defined gains from using big data, just as there were well defined efficiency gains from using mechanized power. In the case of switching from animal to mechanized power the costs and benefits were clear at least in hindsight: give up some self-sufficiency in exchange for some gains in efficiency. In the case of "joining the grid" (or participating in data systems), the costs include the loss of anonymity and relinquish full control over farm data, but the benefits are still not clearly defined. There is a general expectation,



based on observations of some current applications in agriculture and other industries, that by participating in a data community farmers will gain access to previously unattainable insights which may enable better decision making and enhance competitiveness. So to rephrase the question posed in the title: If a farmer decides not to incur the cost of joining the grid, what is the benefit that they will forego as a result?

As economists, we remind the reader to weigh both the costs and benefits of participating in data systems. As usual, the costs are easier to measure than estimating the benefits. At the very least we know that the roles of the farmer are changing, as well as for the crop consultant, salesforce, and manufacturers of technology. However these changes have been the one constant over the history of production agriculture.

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K-State Agricultural Economics | 342 Waters Hall, Manhattan, KS 66506-4011 | 785.532.1504
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