

Agricultural Equipment: Feats of Modern Engineering

In my office sits a canon of agricultural literary works that provide a window back in time. The authors tout the astonishing technology that existed in their day; automatic milking machines, belt-driven threshers, and even the convenience of refrigeration are lauded for their superior efficacy over obsolete methods.

Frankly, it's quite amusing to read their technology eulogies as they reciprocally lambast horse-drawn buggies in support of their modern 10 horsepower two-cylinder, gas-start, diesel operated, steel wheeled, hunks of wrought-iron they call tractors.

Since the dawn of the agricultural revolution, technological improvements in agricultural equipment have been instrumental in cultivating ever larger harvests. Early domestication of draft animals around 6000 BC offered the first “self-propelled” tools, including early forms of the plow. Drills, plows, reapers, threshers, milkers, and many more tools have undergone countless iterations to create modern marvels.

Today, agricultural engineering certainly stands on the shoulders of those giants. I reckon that modern equipment would more-closely resemble a spaceship than farm equipment for some folk born as late as the early 20th century.

I call your attention to the modern combine harvester – the large machine used to harvest grain crops. The “combine” is named as it is because the machine combines the reaping (cutting and accumulating the crop) and threshing (removing the kernels of grain from the plant) operations into one mechanical package. Early iterations of this are owed to the Virginia farmer and engineer, Cyrus H. McCormick of Raphine, Virginia.

The modern combine is a far cry from McCormick’s machine. The newest versions boast 700 horsepower turbo-diesel engines capable of astonishing feats of efficiency and fuel economy. Their power affords them wide crop cutting widths of up to 60 feet, meaning these machines can harvest more than 20 acres per hour in optimal conditions. Inside the cab, modern combines’ layout of touch-screens, monitors, and buttons gives the impression of a NASA control room. Operators can dial-in a myriad of settings down to minute changes that improve machine performance and crop quality otherwise unachievable from combines just 10 model-years older.

Integrating mechanical and digital operations into a comfortable, convenient, and quiet package is no small feat—an accomplishment accurately reflected in their price tag. Loaded modern combine harvesters range from \$600,000 to north of \$1 million. For those interested, the used market isn’t much different with some objectively worn-out machines still pushing a quarter of a million dollars.

So, this harvest season when you see the green, red, and yellow behemoths moving down the road to their next field, please be cautious and respectful of their immense value. Please give space and deference to farm equipment on the roads. Many roadway accidents, especially those

involving harvest equipment, are preventable with a bit more patience. And remember, even more valuable than the technology-ridden machines are the priceless operators inside.

Have a safe harvest!

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