The authors have long been convinced that it would be possible to build a self-cleaning combine for nursery work but the feasibility of using such a machine on material which did not ripen uniformly was questionable. As is so often the case, the problem did not really exist. Immature grain will combine quite readily and can be dried artificially. Where possible, our nursery is separated into early and late blocks to avoid combining immature grain. Where this is not possible the grain in the nursery is combined at the average date ripe for all lines and the seed dried in paper sacks in the greenhouse. There is ample evidence to show that the dry weight does not change during the last 7 to 10 days of normal ripening.

The combine pictured in Figure 1 is a synthesis of ideas. The threshing unit is the standard Vogel nursery thresher. It is powered by a 15-hp air-cooled gasoline motor. The front wheel is driven by a hydraulic motor. The grain and straw are elevated by air pressure.

The idea for using a hydraulic drive for the machine was borrowed from the Engineers at the National Institute for Agricultural Engineers in England. The idea for using an air blast to elevate the grain came from observing underwater recovery gear.

In principle the combine is quite simple. The 15-hp gasoline motor is operated at constant speed to insure proper threshing. The ground power is supplied by the hydraulic system which consists of a pump driven by the gasoline motor, a hydraulic motor attached to the front wheel, a valve to control the oil flow, and an oil reservoir. The hydraulic drive permits control of ground speed without changing the speed of the gasoline motor.

The air blast to elevate the grain is supplied by a 2 × 16-inch pressure fan which is operated at 2500 rpm.

A second model was built to remedy the above criticisms. This model has two front wheels.