

# Improved Data Collection for ATC Ground Pressure Sensors

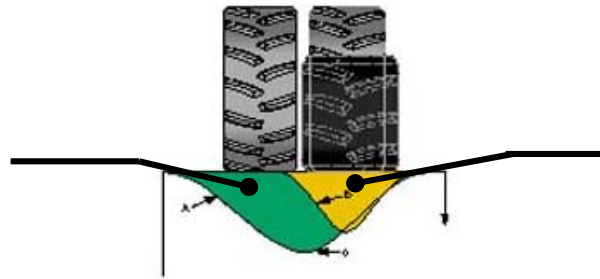
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## Objective:

- Make data acquisition from the ATC\* Ground Pressure Sensor easier and more accurate
- Integrate user friendly electronics
- Design an easy-to-build unit for use by extension agents and faculty for education about the creation of soil compaction



*The improved ATC Ground Pressure sensor allows the operator to measure the amount of pressure that a vehicle is exerting on the ground. Several different points can be measured simultaneously.*



Modern farm machinery is getting larger and heavier; larger tires or tracks are being used to compensate. Our revised Ground Pressure Unit can be used to make measurements and decisions to minimize the equipment's impact on the soil.

\*AgTech Centre of Alberta Canada

➤ATC Soil Pressure Sensing apparatus was developed by the AgTech Centre in Alberta, Canada to measure the peak and residual compression values caused by vehicular traffic on soils

➤The sensing apparatus consists of a rubber bulb connected to a hose filled with hydraulic fluid

➤An auger is used to dig a "tunnel" at a set distance below the soil surface, and the bulbs and attached hoses are inserted under the ground

➤A vehicle (example: Tractor) is driven over the bulbs to determine the amount of pressure that the vehicle is putting onto the ground

➤Originally, dial sight gauges were used for data acquisition

➤Only one point could be measured per test and time based measurements, such as the residual compression of the soil, were difficult or impossible to accurately measure



This apparatus is used for drilling holes beneath the soil surface. A large cordless drill makes the process almost effortless.



Pressure Sensing Bulb, Hose, and Pressure Transducer

- Pressure transducers were coupled to the hoses for pressure sensation
- Current flows through the pressure transducers, and then the current levels are measured by data loggers (HOBOS) at precise intervals
- The HOBOS store test data until downloaded via serial cable to a PC, laptop, or Palm held computer.
- The data are then easily exported to Excel for easier processing



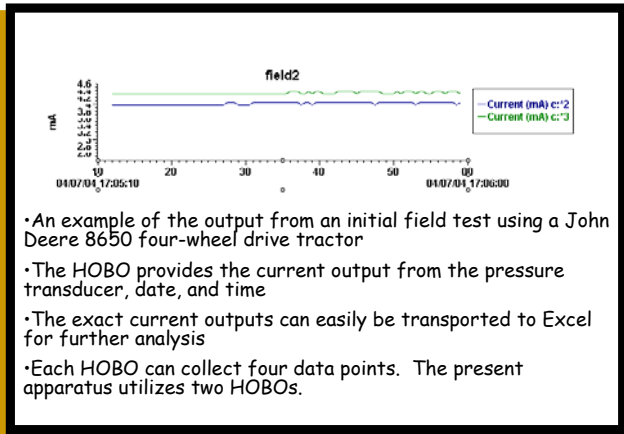
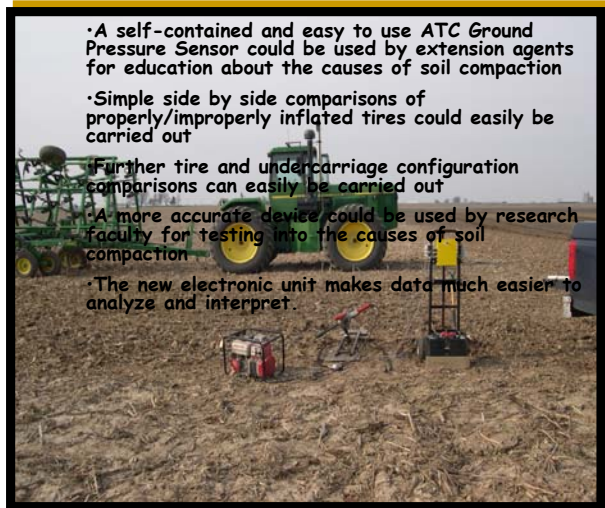
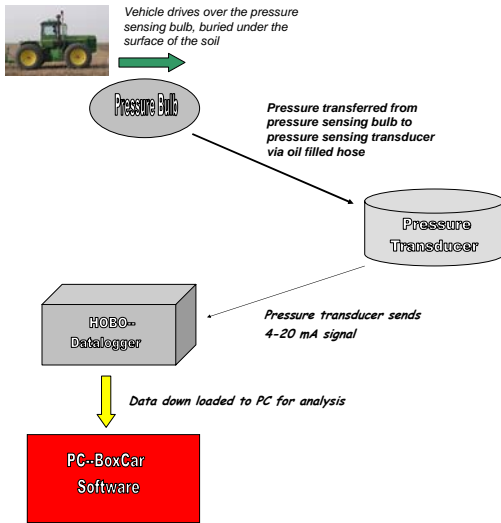
HOBOS data logger. Stores data until data are downloaded onto a PC.



Ground Pressure Sensing Unit Cart. Makes the unit self contained.

- Multiple collection devices can be coupled to one HOBOS, allowing up to four data collection points per unit
- The unit is assembled with two HOBOS, allowing eight data collection points
- Data can be collected over a period of seconds, minutes, or hours
- Data collection can occur up to two times per second
- Data collection no longer depends on the accuracy of the human eye
- All data points are collected consecutively with minimal effort for the operator





Side by side comparisons can be carried out simultaneously comparing varying tire inflation pressures, tire and undercarriage configurations.

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