

## 2022 Soil Organic Carbon Sequestrat on

Soil conservat on pract ces go beyond prevent ng soil loss and can enrich soil with nutrients such as soil organic carbon (SOC). Some best management pract ces (BMPs) have been shown to sequester SOC in agricultural soils. The sequestrat on of SOC is not only important for the health of agricultural soils, but also can serve as a carbon sink to help reduce greenhouse gases (GHG), which are a main contributor to Global Climate Change.

The Indiana Conservat on Partnership (ICP) aids landowners in implement ng thousands of best management pract ces across the state that can sequester carbon in soil every year. Two key BMPs for aiding in SOC sequestrat on are plant ng cover crops and implant ng a no-t II agriculture system.

The amount of SOC sequestered from cover cropping and ut lizing a no-t II system will vary based on many factors. Research by C. Poeplau and A. Don has shown a mean annual SOC sequestrat on value of  $0.14 \pm 0.04$  t/ac/y from cover crops. This value was used to est mate the amount of SOC for all the ICP cover crop pract ces. This does not include the many cover crop BMPs implanted throughout the state without assistance from the ICP.

In 2022 the ICP assisted with implementat on of 8,278 cover crop pract ces. This resulted in the sequestrat on of an est mated 34,002 tons of SOC, which is the equivalent of 124,601 tons of CO<sub>2</sub>, or about the yearly emissions of 24,432 cars.

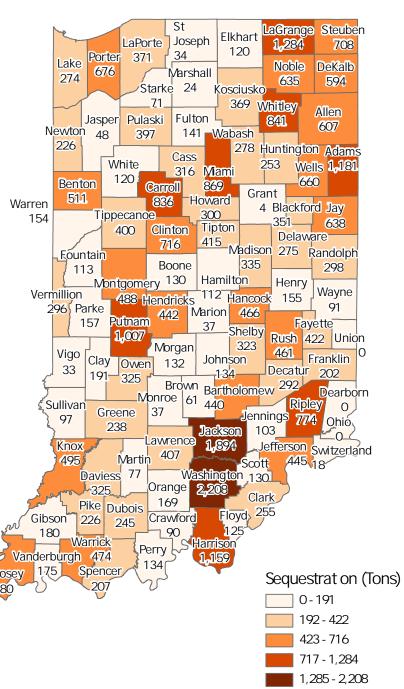
34,003 tons of SOC sequestered from cover crops

Which is the equivalent of 124,601 tons of  $CO_2$ 



The approximate mass of carbon dioxide  $(CO_2)$  removed from the atmosphere by the sequestrat on of SOC can be calculated based on the stoichiometric mass rat o of  $CO_2$  to carbon. The U.S. EPA est mate that a typical passenger vehicle emits about 5.1 tons of  $CO_2$  per year. This means approximately 10 acres of cover crops sequesters the yearly carbon omissions of a typical passenger vehicle.

## Tons of Soil Organic Carbon Sequestered From Cover Crops





SOC sequestrat on for no t II was est mated with the DNDC (Dent f cat on-Decomposit on) model. The DNDC model is a processed based model for predict on carbon and nitrogen biogeochemistry in agricultural ecosystems at site and regional scales. The model was developed by the Inst tute for the Study of Earth, Ocean, and Space at the University of New Hampshire. The model consists of a variety of submodels for specific geochemical and biochemical react ons which together allow it to est mate the total change of nitrogen and carbon in soils.

In 2022 the ICP assisted with implementat on of 2363 no t II pract ces that were able to be modeled with DNDC. This resulted in the sequestrat on of 14,490 tons of SOC compared to if those acres used convent onal t Ilage pract ces, which is the equivalent of 53,097 tons of CO<sub>2</sub>, or about the yearly emissions of 10,411 cars

14,490 tons of SOC sequestered from no-t II

Which is the equivalent of 53,097 tons of  $CO_2$ 



Soil Organic Carbon Sequestrat on (tons)

## Tons of Soil Organic Carbon Sequestered From No-Till Agriculture

