

## Why consolidation?

While removing water from the field is ideal for drainage, it is not always feasible. It is more efficient to consolidate many wet spots into one area to reduce mechanical overlap, increase farmable area, and decrease missed area if removal is not possible.

## What is mechanical overlap?

Mechanical overlap occurs when the same area of field is passed over twice or more with machinery or inputs. This is an inefficient use of inputs and time. Technology such as GPS, RTK, and Automatic Section Control are used to reduce overlap.

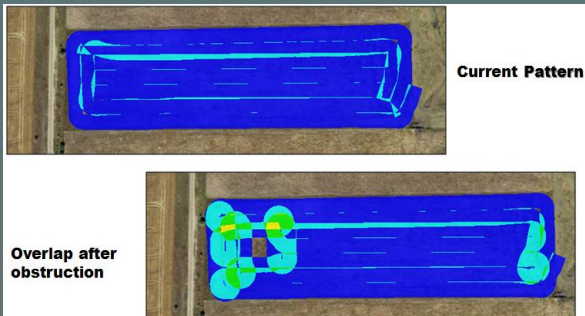


Figure 1. Example of decreased field efficiency after installation of an in-field obstruction (Serecon mapper)

## What are the effects of consolidation?

To assess the actual effects of consolidation, PAMI performed a simulation on a quarter section using LiDAR elevation data collected on a Manitoba field with multiple surface depressions. GIS software was used to simulate consolidation and a mapping software was used to simulate field operations with various implement widths. The following results were achieved:

- An increase of farmable land by 4.25 acres (2.7% total field area)
- Reduction in travel distance by 4-15%\*
- Reduction in acre overlap by 13-40 acres, resulting in 8-25%\* increase in efficiency
- Reduction in input overlap by 5-16\* acres

\*Depending on implement width, 24'-150'

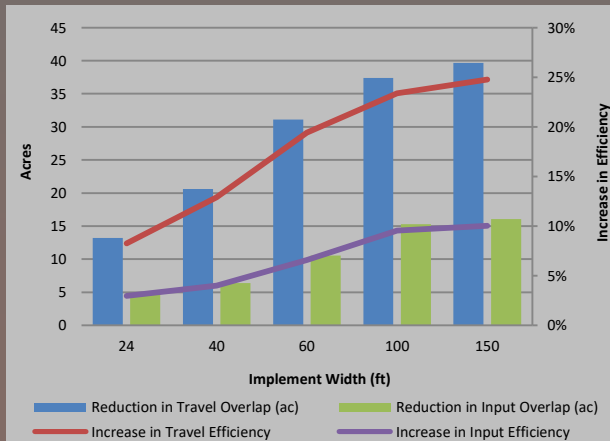


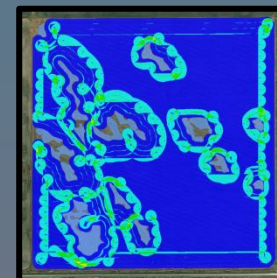
Figure 2. An optimal system provides the maximum economic benefit for the cropping system

## What causes overlap?

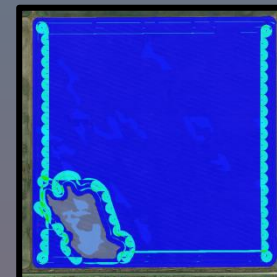
Anything that requires a deviation from the straight path of machinery down the field can cause overlap. This includes turning at headlands or navigating around obstacles in the field such as trees or standing water. Obstacles or headlands with irregularly shaped borders cause increased mechanical overlap.

## The Takeaway

Consolidation of surface water reduces travel and input overlap, and increases efficiency and productivity.



Before Consolidation



After Consolidation

Figure 3. More obstacles results in greater overlap.



Figure 4. Corn ears sampled between single-pass and double-pass areas (ACES, 2014)