

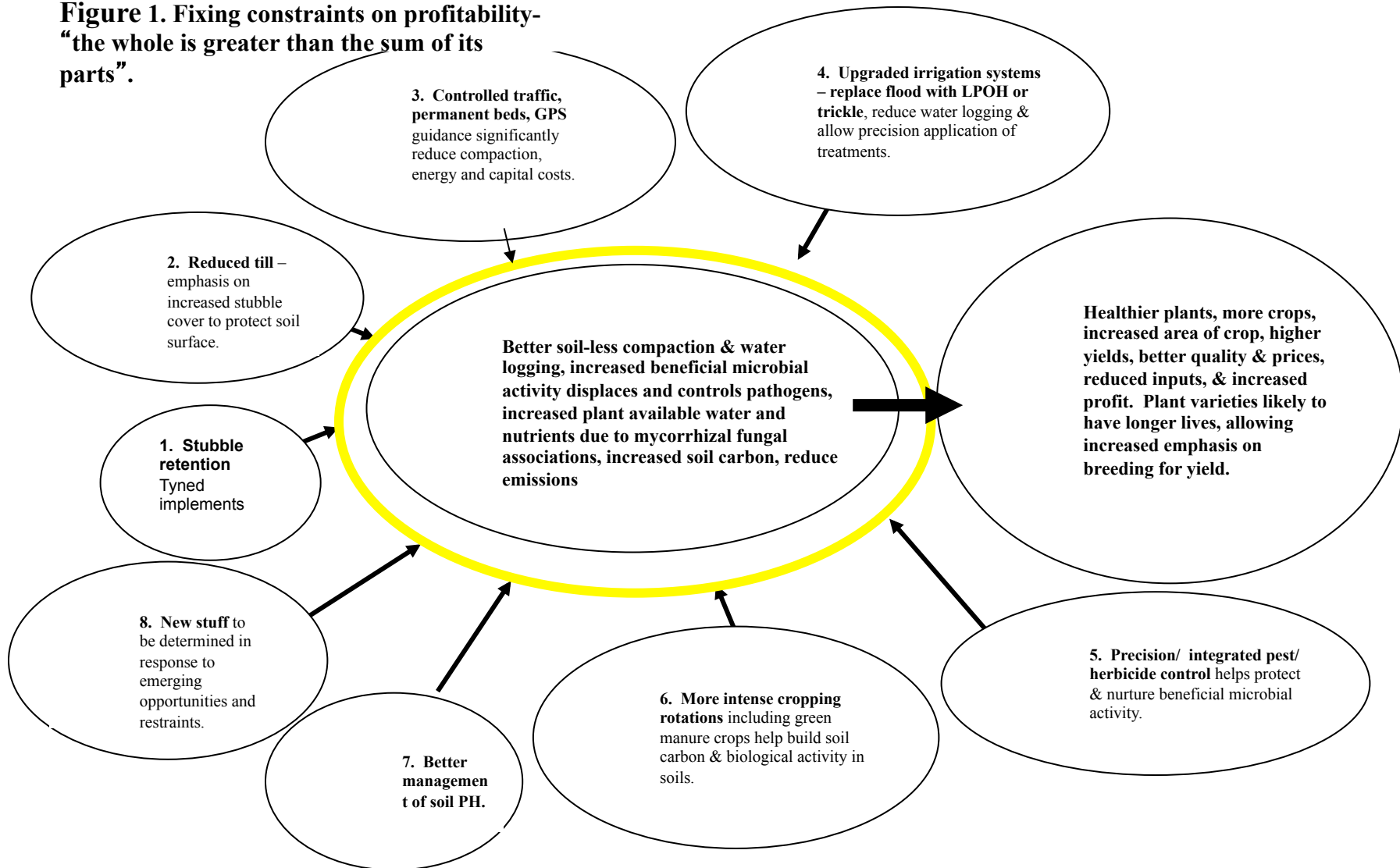
Assessing the economic value of controlled traffic farming practices.

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When assessed in isolation, the net direct benefits of CTF (fuel, oil, repairs) aren't often not compelling when all the costs of implementation are considered- good but not an imperative.

- Hence the need to consider additional gains on the income side
- Not a lot of evidence in support of income gains hence the need to examine the production system identify why and where these gains may arise.
- Simple models of production systems used to explore and explain why yield gains may occur.

**Figure 1. Fixing constraints on profitability-
“the whole is greater than the sum of its
parts”.**



Other push/pull influences

- Increased fuel, machinery and fertilizer prices.
- Shortages & “protectionist” rationing of fertilizer.
- Controlled traffic systems will become cheaper & easier to use.
- Pest & disease issues may evolve that don't have magic bullet solutions. Reduced R&D, longer lead times for new treatments- a need for more resilient, better buffered systems.
- A growing realisation that natural, biological processes can enhance the efficacy & life of current chemical treatments.
- **Ultimately, it will be the profitability of the emerging system that will drive the change.**

General comments:

Benefits due to stand alone treatments are often quite small and usually aren't associated with significant yield gains.

The inner oval represents the sum of all gains. The sum of all gains for the system is expected to be significantly greater than if each component was assessed separately and the total added together due to the complimentary benefits that accrues to the system when a significant number of the practices have been implemented.

Many issues will arise (new production limitations will emerge) without immediate solutions & producers & those supporting them will sort it out as they go.

Inspired by ‘**An Agricultural Testament**’ Sir Albert Howard. Copyright 1943 by Oxford University Press, Inc. First published in England, 1940.

http://journeytoforever.org/farm_library/howardAT/AT1.html

(Jim Page, Agricultural Economist, 07 5453 5819)

Current sugar cane system with flood irrigation, 'with or without' CTF & GPS.		
Conventional tillage, or Controlled traffic.		
Water applied via flood irrigation systems.	Need for regular laser levelling to minimise water logging with soil compaction an adverse by-product.	Water logging and compaction effect soil & plant health & performance. Soil compaction necessitate ripping and additional cultivation to remediate clods. High fuel use and power requirement.
Continue burning & minimise trash to allow good management of flood flows.	Opportunity to build soil carbon/soil organic matter is forgone.	
Tillage operations required to control weeds and to correct compaction from laser levelling & other operations.	Minimal improvement in soil condition, minimal development of beneficial soil biota.	Compaction & water logging continue to be issues.
Include legume fallow cover crops in rotation	Contribution to soil organic matter & soil N is lowered by the ongoing need to cultivate	Reduced carryover of legume benefit to following plant crop.
Changing other management practices (fertilizer, herbicides, insecticides etc in order to optimise soil conditions will be of limited value	The potential benefits associated with changing other management practices are restricted by ongoing compaction and other soil health issues	Beneficial mycorrhizal associations between plant & soil fungi do not have the opportunity to develop. Crops are weaker & less able to withstand pathogens.
	Minimal gain due to CTF	Yield decline, shorter ratoons with resulting reduction in harvested area, higher costs, varieties have shorter lives, breeders required to shift focus to pathogen resistance instead of yield.

Proposed sugar cane system ‘with’ Low pressure overhead irrigation plus CTF & GPS.

Controlled Traffic with GPS		Reduced fuel and power requirement.	
Low pressure overhead or trickle irrigation		More precise, reduced application of irrigation water.	Minimal requirement for laser levelling, minimal compaction and water logging.
Stop burning, retain trash		Increased soil carbon, organic matter.	Trash helps control weeds, reduces need for cultivation.
Minimise tillage (reduced need for weed control or compaction repair)		Improved condition for development of beneficial soil biota.	Reduced soil disturbance from cultivation, reduced compaction with control traffic & build-up of soil organic matter encourages biological activity in soil.
Include legume fallow crops in rotation		Recovery of soil after cropping phase, provide N for following crops	Reduced tillage & improved soil condition maximises value of recycled fallow crops
Assess & change other management practices (liming, fertilizer, herbicides, insecticides etc in order to optimise soil conditions		The benefit of changing other management practices is maximised by the healthy soil that develops under this system	Development of beneficial mycorrhizal associations between plant & soil fungi. Crops better able to access nutrients & water from soil. Plant roots may be protected from pathogens by the association. Stronger, healthier, higher yielding plants
		Significant gains attributed to CTF.	Higher yields, longer ratoons, lower costs, varieties have longer lives, breeders able to increase emphasis on yields instead of pathogen resistance.