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Sustainable Intensification of Agriculture in Victoria's Food Bowl: Optimizing Productivity with the use of Decision-Support Tools

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Abstract : A participatory and engaged approach is key in connecting agricultural managers to sustainable agricultural systems to support and optimize production in Victoria’s food bowl. A sustainable intensification (SI) approach is well documented globally, but participation rates amongst Victorian farmers is fragmentary, and key outcomes and implementation strategies are poorly understood. Improvement in decision-support management tools and a greater understanding of the productivity gains available upon implementation of SI is necessary. This paper reviews the current understanding and uptake of SI practices amongst farmers in one of Victoria’s premier food producing regions, the Goulburn Broken; and it spatially analyses the potential for this region to adapt to climate change and optimize food production. A Geographical Information Systems (GIS) approach is taken to develop an interactive decision-support tool that can be accessible to on-ground agricultural managers. The tool encompasses multiple criteria analysis (MCA) that identifies factors during the construction phase of the tool, using expert witnesses and regional knowledge, framed within an Analytical Hierarchy Process. Given the complexities of the interrelations between each of the key outcomes, this participatory approach, in which local realities and factors inform the key outcomes and help to strategies for a particular region, results in a robust strategy for sustainably intensifying production in key food producing regions. The creation of an interactive, locally embedded, decision-support management and education tool can help to close the gap between farmer knowledge and production, increase on-farm adoption of sustainable farming strategies and techniques, and optimize farm productivity.

Keywords : agriculture, decision-support management tool, Geographic Information System, GIS, sustainable intensification
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