

Assessing the Actions of the Farm Managers to Execute Field Operations at Opportune Times

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Abstract : Planning agricultural operations requires an understanding of when fields are ready for operations. However determining a field's readiness is a difficult process that can involve large amounts of data and an experienced farm manager. A consequence of this is that operations are often executed when fields are unready, or partially unready, which can compromise results incurring environmental impacts, decreased yield and increased operational costs. In order to assess timeliness of operations' execution, a new scheme is introduced to quantify the aptitude of farm managers to plan operations. Two criteria are presented by which the execution of operations can be evaluated as to their exploitation of a field's readiness window. A dataset containing the execution dates of spring and autumn operations on 93 fields in Iowa, USA, over two years, was considered as an example and used to demonstrate how operations' executions can be evaluated. The execution dates were compared with simulated data to gain a measure of how disparate the actual execution was from the ideal execution. The presented tool is able to evaluate the spring operations better than the autumn operations as required data was lacking to correctly parameterise the crop model. Further work is needed on the underlying models of the decision support tool in order for its situational knowledge to emulate reality more consistently. However the assessment methods and evaluation criteria presented offer a standard by which operations' execution proficiency can be quantified and could be used to identify farm managers who require decisional support when planning operations, or as a means of incentivising and promoting the use of sustainable farming practices.

Keywords : operation management, field readiness, sustainable farming, workability

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