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## **“AgBalance – My Virtual Farm”. A Simulation Game for a Competition of Students and Scientists in Order to gain Insights into the Concept of Tradeoffs in Sustainable Agriculture**

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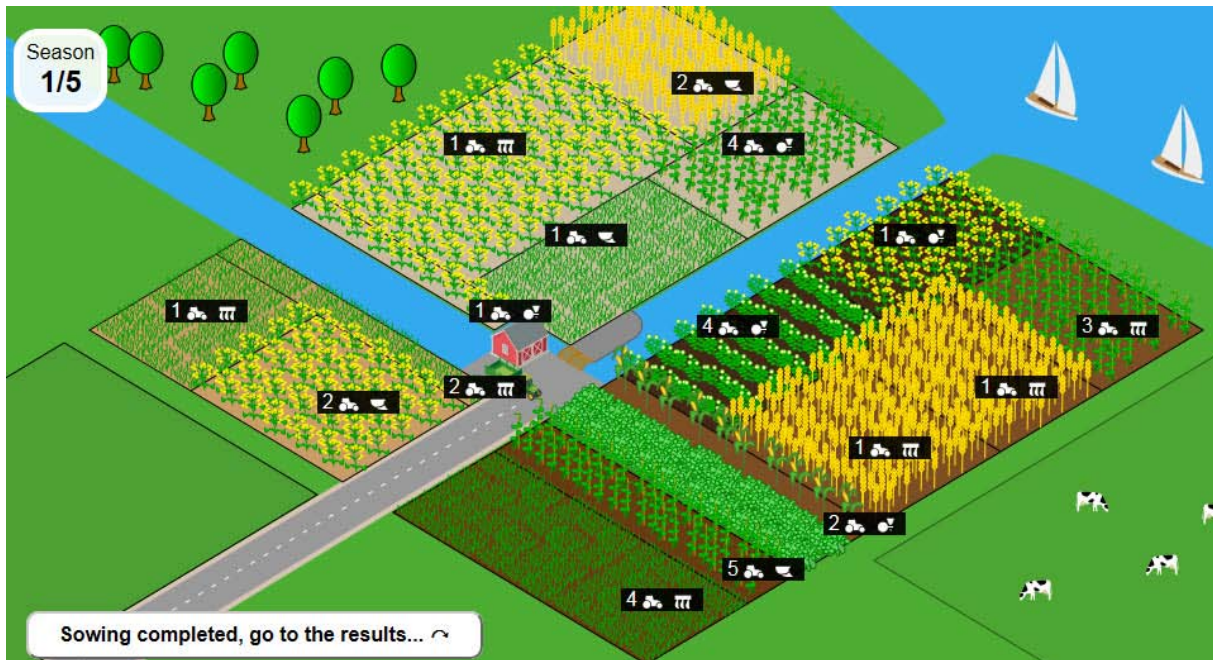
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AgBalance comprises a multi-criteria life cycle based approach in combination with a defined aggregation and summary of single results into a single sustainability score (Frank et al. 2012). AgBalance™ delivers results that enable farmers, the food industry, politicians and society to objectively evaluate processes in terms of their sustainability profile. In doing so, a vast amount of information on individual factors can be ascertained in addition to overall statements on the sustainability of agricultural practices (e. g. ploughing). AgBalance was finalized in mid of 2011. In September 2011, the methodology was given independent assurance by the global expert agencies such as DNV Business Assurance. AgBalance™ can be used to map an individual farm or the whole agricultural sector in one region, for example. The focus can either be on the agricultural production system alone or on the processes that have established themselves downstream in the value chain, such as logistics or processing. Measuring sustainability can be a central key to steady improvements towards sustainable agriculture. It is therefore an essential requirement that it succeeds in translating results from complicated life-cycle analyses into farmers' everyday reality and to derive specific recommendations for action from this. Novel IT solutions are required in order to make use of LCA-based knowledge for a more sustainable crop management on-farm. This is the basic idea of the online game “AgBalance – My Virtual Farm”.

In this simulation game, the objective is to run a European farm for a maximum of five seasons. The players decide on the crops to be grown and their rotational sequence or agro-environmental sequence, respectively, the degree of intensity of the production, and the tillage system used. The goal is to get the best "sustainability score" over the up to five seasons, and this "sustainability score" consists of farm profit (50%) plus a number of environmental indicators (i.e. Global Warming Potential, Eutrophication, Ecotoxicity, Soil Health and Biodiversity Potential), each contributing a 10% weighting to the final sustainability score. Moreover, randomly applied 'event cards' (or 'community chest') are played in a random fashion, e.g. extreme weather conditions or changes in subsidy schemes. The intention of this game is to showcase tradeoffs associated to sustainable agriculture and their solution. The underlying assumptions are taken from BASF's yearlong experience with the AgBalance methodology as outlined above. Moreover, randomly applied 'event cards' (or 'community chest') are played in a random fashion, e.g. extreme weather conditions or changes in subsidy schemes.

The game is designed to provide a self-learning exercise to better understand the complex field of sustainable agriculture. It can be nicely played at the conference in a approx. 2 hr session and is well suited for a student competition.



**Screenshot of the “AgBalance – My Virtual Farm” simulation game.**

This game is well suited to be used for a group competition at the IgIs conference.

## References

Frank M, Schöneboom J, Gipmans M & Saling P (2012) Holistic sustainability assessment of winter oilseed rape production using the AgBalance™ method – an example of ‘sustainable intensification’?, in: Corson, M.S., van der Werf, H.M.G. (eds.), Proceedings of the 8th International Conference on Life Cycle Assessment in the Agri-Food Sector (LCA Food 2012), 1-4 October 2012, Saint Malo, France. INRA, Rennes, France, p. 58-64.