WCCLF 2021

II World Congress on Integrated Crop-Livestock-Forestry Systems

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PREFACE

Promoted by the Ministry of Agriculture, Livestock and Food Supply - MAPA; Brazilian Agricultural Research Corporation - Embrapa; ICLF Network Association; State Secretariat for the Environment, Economic Development, Production and Family Agriculture - SEMAGRO; Federation of Agriculture and Livestock of Mato Grosso do Sul - Famasul; and FB Eventos, the II World Congress on Integrated Crop-Livestock-Forestry Systems (WCCLF 2021) took place on the 4th and 5th May 2021 in a 100% digital format.

The objective of the Congress was to provide a forum for discussion, theoretical insights and practical applications related to technology as well as economic and environmental aspects of mixed agricultural systems that combine integrated production of crops, animals and trees in the same area, having an efficient use of inputs, all being essential for food security in the future.

ICLF is a production strategy that integrates crop, livestock, and forestry farming in the same area, in a consortium, rotated or in succession, so that there is interaction among components, generating mutual benefits.

For two days, we discussed issues related to challenges and opportunities for ICLF systems around the World; solutions and demands from Agribusiness Companies; scenarios and trends of ICLF in the World; current hot topics in ICLF; solutions and demands for ICLF from the farmer's view; Public Policies for Supporting ICLF; and innovation on ICLF systems.

The integrated agricultural production systems can be implemented combining two or three components, according to the particularities of each farm and region. They can also be adopted in small, medium, and large farms, in different biomes, using different crops, livestock and trees species. Among the many benefits of ICLF are increasing total yields of a given area, diversification of income sources, better use of inputs, improvement of soil chemical, physical and biological qualities, along with improvement of animal welfare as well as jobs and income generation. In addition, ICLF systems reduce pressure to clear new areas, it helps to recover degraded low yielding areas while mitigating greenhouse gas emissions, increasing carbon sequestration in soil and biomass. These benefits corroborate with three of the Sustainable Development Goals - SDGs:

- SDG 2 - End hunger, achieve food security and improved nutrition and promote sustainable agriculture;
- SDG 13 - Take urgent action to combat climate change and its impacts; and
- SDG 15 Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

These Proceedings report 166 scientific contributions approved by the scientific committee of the WCCLF 2021 and 18 papers from speakers that also contributed to this publication.

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Lucimara Chiari (Executive Secretary of the WCCLF 2021)

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SEED ANALYSIS IN SOYBEAN CROP AT ILPF SYSTEMS OF EMBRAPA AGROSILVOPASTORAL – CROP SEASONS: 2014/15, 2015/16 AND 2016/17

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ABSTRACT
In the 2014/15, 2015/16 and 2016/17 crop seasons at integrated agricultural systems experimental area located Embrapa Agrosilvopastoral, an analysis of soybean seed pathology was carried out in the treatments: LAV (soybean crop followed by corn + brachiaria), ILPF1 (crop- livestock-forest, crop rotation with livestock every 2 years); ILPF2 (crop-livestock-forest integration, with crop and animal entry after the corn harvest, every year); ILP (crop-livestock integration, crop and rotation with livestock every 2 years) and ILF (crop-forest integration) .The Blotter test was used and based on the results obtained, so far, none of the studied systems had a negative impact on the quality of soybean seeds. As this is a long-term experiment, monitoring will continue to be carried out over the next few years, thus subsidizing information for the correct adoption of this system in the State of Mato Grosso, Brazil.
Key words: ILPF; soybean; seed pathology

INTRODUCTION

The crop-livestock-forest integration system (ILPF) is a sustainable production system that integrates agricultural, livestock and forestry activities, carried out in the same area, in intercropped cultivation, in succession or in rotation, and seeks synergistic effects between the components of the agro-ecosystem contemplating the environmental adequacy, the valorization of the man and the economic viability of the agricultural activity (KLUTHCOUSKI et al., 2015). This system has the advantages of improving soil attributes, greater use of nutrients, breaking the cycle of pests and plant diseases, reducing economic risk, by diversifying activities, and also reducing costs with the recovery of degraded pastures (SILVA et al., 2011). 90% of the crops used for food are propagated by seed and specifically in the soybean crop, the main pathogens that cause diseases are transmitted by the seed (HENNING, 2005), thus, the objective of this work was to evaluate the sanitary quality of soybean seeds of the 2014/15, 2015/16 and 2016/17 crop seasons.

MATERIAL AND METHODS

Soybean seeds were collected during the crop seasons of following treatments: LAV (soybean crop followed by corn + brachiaria), ILPF1 (crop-livestock-forest integration, LAV crop, but rotated with livestock every 2 years); ILPF2 (crop-livestock-forest integration, with LAV tillage and bovine animals entry after corn harvest, every year); ILP (crop-livestock integration, farming according to LAV and rotation with livestock every 2 years) and ILF (crop-forest integration). The soybean cultivars used were BRS GO 8560 RR 2014/15), BRSMG 850 RR (2015/16), M8210 Ipro (2016/17). Seed samples were collected at different distances from the trees, in the 2014/2015 and 2015/2016 crop samples were collected at a distance of 4m, 7.5m and 15m (north and south) and in the 2016/2017 crop if samples with a distance of 3.5m, 8m, 12m and 15m (north and south). For seed pathology analysis, the Blotter test was used, according to international recommendations (NEERGAARD, 1979), with some modifications. Four hundred seeds of each treatment (20 seeds per repetition) were distributed in gerboxes measuring 11x11 cm, containing three sheets of qualitative filter paper previously moistened in diluted agar (10 g of agar/1,000 mL of water) and in a solution of 2, 0.02% 4 D (sodium 2,4-dichlorophenoxyacetate - 2,4-D herbicide). The seeds were incubated for seven days at a temperature of 22ºC, under a photoperiod of 12 hours of light (fluorescent lamps type "daylight" and black "NUV") for 12 hours in the dark. After the incubation period, it was observed, with the aid of a stereoscopic microscope, the occurrence of seeds with fungi, the results being expressed as a percentage of each pathogen detected.

RESULTS AND DISCUSSIONS

Colletotrihum sp., *Phomopsis* sp., *Cercospora kikuchii*, *Fusarium* sp., and *Aspergillus* sp., were found in all harvests. For *C. kikuchii*, there was no difference between the values found in the different sampling points, nor between those with the single crop treatment, in any of the crops presented. In the 2016/2017 crop, the occurrence of *C. kikuchii* was much higher than the two previous harvests. In the 2014/2015 and 2015/2016 harvests there was no significant difference between the sampled points and even with the single crop treatment. In the 2016/2017 crop, for *Colletrotrichum* sp., With the exception of points 3.5S, 3.5N and 15N, the treatment ILPFt (triple lines) showed higher values than ILPFs (single lines) and single tillage. In relation to *Phomopsis* sp., There was no difference between the values found in the different sampling points or between those with the single crop treatment, in the 2014/2015 harvest. In the 2015/2016 harvest, the points sampled in the distances closest to the trees, on the north side, had a higher occurrence. In the 2016/2017 crop, no significant differences were found between the sampled points or between treatments. For *Corynespora cassiicola*, there was no difference between the values found in the different sampling points and neither between those with the single crop treatment in the 2014/2015 harvest. Analysis of data on the occurrence of *Fusarium* sp. in soybean seeds harvested in different positions of an ILPF system with triple rows of eucalyptus in the 2014/2015 and 2015/2016 harvests, resulted in no difference between treatments. The seeds collected in 4S in the 2016/17 crop season had a lowest incidence compared to the others and there was no difference between the values found in the other sampling points and neither between them with the single crop treatment. The transformed data of the occurrence of *Macrophomina* sp. showed that there was no difference between the values found in the different sampling points and neither between them with the single crop treatment, in any of the crops presented. In relation to seed analysis, the systems apparently did not influence the incidence of pathogens in soybean seeds, although in the 2016/2017 crop there was a higher incidence of *Colletrotrichum* sp. in some points, the same was not observed with Phomopsis sp., Pathogen whose occurrence in seeds is commonly associated with the presence of *Colletrotrichum* sp.. Probably the few differences found are related to the climatic conditions of each season, especially at harvest time

CONCLUSIONS

Based on the results obtained, so far, none of the systems studied has negatively affected the quality of soybean seeds.

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