Arbeitsgemeinschaft
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Council for Tropical and Subtropical Agricultural Research

ATSAF - CGIAR++ Junior Scientists Program Final Report

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Start and end date of stay at IARC: -
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Title: Prediction of hybrid performance for GLS and TLB resistance in tropical maize germplasm

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Junior Scientist Program (JSP) – ATSAF:

It is one of my great achievements and pleasure to receive the ATSAF- Junior Scientist Program (JSP) scholarship for my master's thesis at International Agricultural Research Centre CIMMYT, Kenya

My deepest gratitude to ATSAF (Arbeitsgemeinschaft für Tropische und Subtropische Agrarforschung e.v.) funding sponsors and all the selection committee members for accepting my thesis proposal and granting me the funding opportunity under the Junior Scientist Program. I am very honored to be a part of the ATSAF scholarship holders for my master thesis.

I would also convey my sincere thanks to my thesis supervisor at CIMMYT Dr. Manje Gowda, who gave me this wonderful opportunity to work on his research project on Maize for developing disease-resistant varieties suitable for the tropical climate. I would also be thankful to my university supervisor Prof. Dr.Thomas Miedaner at the University of Hohenheim, who has supported me a lot during the writing part of my thesis and guided my thesis work. Lastly, thanks a lot to the library staff at Hohenehim for their kindly support in search of materials and for assisting me in using the library books and media.

Experience with IARC:

It is a great opportunity to work in one of the renowned International Agricultural Research Center (IARC), CIMMYT, which comes under the Consultative Group for International Agriculture Research (CGIAR) institutes. CGIAR is a great global partnership that integrates all the International Institutes, whose research is engaged in global food security. Wherein CIMMYT is a non-profit organization that develops improved varieties of wheat and maize with the aim of contributing to food security, and innovates agricultural practices to help boost production, prevent crop disease, and improve the smallholder farming community.

Initially, my work was planned in my presence at CIMMYT, Kenya but unfortunately, due to the COVID-19 situation in Kenya, my work has been done remotely under the supervision of my scientist and the guidance of a university supervisor. My thesis topic on "'Prediction of hybrid performance for GLS and TLB resistance in tropical maize germplasm" has given me the enough opportunity to implement my theoretical knowledge learned through various courses at the University of Hohenheim as part of my master's program.

The efforts of the CIMMYT maize breeding program were quite impressive and grabbed my interest to be a part of the global maize research. My work activities include literature review, data collection, DNA sampling, and data analysis are included. However, as I was unable to visit the CIMMYT due to the covid situation, I received all the required phenotypic and genotypic data from the CIMMYT supervisor. In this regard, I would like to convey my sincere thanks to all the field and lab technicians at CIMMYT, who helped me with the collection of the required phenotypic data and DNA sampling.

In my personal view, I really enjoyed the distant mode of learning and I feel, that weekly review meetings and reports helped me a lot in completing my work successfully. In this regard, I became capable of managing the work tasks distantly and gained hands on experience and a new skill set of collaborating with other scientists at other institutes and I hope it will have a great impact on my further personal and professional growth. I could not have acquired this distance learning skill this soon, if not for the pandemic situations. It is because of these online zoom meetings, I do a lot of literature research on my own and in this process, my approach to the thesis work has improved significantly.

Further use of my Thesis Work:

Despite the significant growth in maize production worldwide, maize yields in sub-Saharan Africa (SSA) are amongst the lowest in the world. Average yields in this region range from 1-3 t per hectare well below the global average of around 5 t per ha. In SSA, almost half of the calories and protein consumed are provided through maize. Several factors including abiotic and biotic stresses limiting the maize productivity. Biotic stresses like gray leaf spot, maize lethal necrosis, and turcicum or northern corn leaf blight have been reported to cause considerable loss in yield. The development of high-yielding and disease resistant maize lines and hybrids adapted to various agro-climatic conditions is led by the International Maize and Wheat Improvement Center (CIMMYT), in partnership with NARS and released several promising hybrids in SSA.

The promising significant GWAS hits obtained in the diversity panel will be used for further validation and for the marker assisted breeding to accelerate GLS and TLB resistance. Through the genomic selection of promising cross hybrids, the number of undesirable genotypes to be tested in the field were discarded which ultimately saves the available resources.

Challenges faced during the course of my thesis work:

Initially, it was hard to sit in a single room to progress my research work, but after a few days I got used to work without any stress. And moreover, I was expecting to expand my network with various professional working with different aspects useful for farmers welfare. But, I really had a great connection with my supervisor and project partners where I was involved in various discussions and further improved the project plan.

I have also missed the opportunity to do field visits at different locations because of the online thesis work. I had to collect a part of the data required for my thesis work. But, because I did not have the chance to visit CIMMYT, my supervisor managed with the data that is required for the data analysis. Although, I have missed a few opportunities, finally at the end I got a fruitful work.

Also, one of the major problems I encountered is, not having a chance to establish personal touch in the connections I got to encounter throughout my thesis work. Had I got the chance to work at CIMMYT institute, I could have established much more healthier connections with various research groups, which is very much useful for my further professional career. Also, this loss of personal touch was partly compensated by having regular zoom meetings with the supervisor and other data analyst tutor from CIMMYT.

Importance of ATSAF funding:

The ATSAF JSP program is one of the great initiatives to support master's students to complete the thesis work without any financial burden. The JSP program has provided me with a great opportunity to collaborate my thesis work with my university and the International Agriculture Research Center. Working with CIMMYT has improved my exposure to international scientists and focus on global research areas. This great opportunity to work in an international environment will help me in shaping my professional career in further global collaborations. I hope it will also boost my profile to work in any international research institutes.

It is my desire as an international student to work with the international research institutes, but this desire could have been held back because of the costly expenses involved in it. Because of the ATSAF funding, I have had less financial pressure and so I could concentrate more on my thesis research. Otherwise, it would have become necessary for me to earn my monthly expenses from the part-time job which could have had a negative impact on my academics. I hope this program further continues to help many more master's students to write their thesis with reputed IARC spread all over the world.

Thank you to all the ATSAF team and sponsors for giving me this wonderful opportunity.

Kind regards
Kiran