Keynote Forum
March 09, 2022

Plant science 2022





4th International Conference on

Plant Science and Agriculture

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Tarlok Singh Sahota

Lakehead University Agricultural Research Station, Canada

Environmentally Smart Nitrogen (ESN) – potential for improving modern crop production and N-use efficiency

ESN is polymer coated urea that could release N matching with crop requirements. I was the first to initiate research on ESN in field crops in Ontario, Canada in 2006; initially on timothy, spring wheat and winter wheat and later (till date) on bromegrass, grass mixtures (timothy, bromegrass, orchardgrass), other forages (barley, silage corn, oat, MasterGraze corn and sorghum sudangrass) feed barley and canola. In winter wheat, in 3 out of 6 years ESN gave ~0.6 MT/ha higher grain yield than urea. In spring wheat, in a relatively warmer year with well spread rainfall, ESN produced 1 MT/ha higher grain yield than urea; averaged over 3 years, 2/3rd N from urea and 1/3rd N from ESN could be recommended. Two third N from urea and 1/3rd N from ESN gave ~1 MT/ha extra seed yield than urea alone @ 180 kg N/ha in 2016 and 2017. Entire N from ESN in winter/spring wheat could be applied in seed rows at seeding without any detrimental effect. Highest barley grain and forage yields were recorded by urea @ 50 kg N/ha + ESN @ 20 kg N/ha; that recorded 1.2 MT/ha more forage yield than urea. Partial substitution of N from urea with ESN improved forage dry matter yield of timothy and MasterGraze corn (100 kg N/ha from urea + ESN (3:1 N) equaled that with urea @ 150 kg N/ha in yield, % protein and RFV!), but not that of winter cereals for forage, silage corn and sorghum sudangrass. At equal rates of N, single/fall application of ESN in timothy and bromegrass gave equal yield to urea applied in two splits in spring/summer. Spring wheat grain yields were the same with fall/or spring application of ESN. ESN/or urea + ESN (3:1 N) increased the grain/forage protein content in almost all crops by 1-2 % points at an extra cost of only $ 6.0-10.5/ha. The results indicate that ESN could improve both crop yields and quality, make better use of N/and increase N-use efficiency. The presentation summarizes results from over 10 years and the results could be applicable globally under situations of high N losses from readily available N sources such as urea.

Speaker Biography

Tarlok Singh Sahota is originally from a family farm with a Ph.D. in agronomy and an international course for development oriented research in agriculture, Wageningen, the Netherlands, has over 30 years of experience in agricultural research, extension and development worldwide. He has made a significant impact on farms by introducing new crops/crop varieties and beneficial nutrient management practices. He has developed over 10,000 acres under contract mint farming for AM Todd Company USA and has managed large scale commercial farms, including a fresh produce export project. He is an Ontario CCA since 2007, was nominated for the CCA award of excellence in 2013, is a member of the OFCC and American society of agronomy, was twice an Eastern director of the Canadian Society of Agronomy (CSA), President elect in 2014-15, President in 2015-16 and is Past president of the CSA since july 2016. He has been an adjunct professor with the faculty of natural resources management, Lakehead University, Thunder Bay, Ontario since july 1, 2013. He was presented with an award of honor by the alumni association, Punjab Agricultural University, Ludhiana, India in 2015, fellow of the Canadian Society of Agronomy (CSA) by the CSA in 2018 and the distinguished agronomist award of the CSA by the CSA in 2021.

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Gideon Grafi

Ben-Gurion University of the Negev, Israel

Epigenetic mechanisms associated with drought tolerance in the desert plant *Zygophyllum dumosum boiss*

Plants thriving in harsh desert environments provide a suitable bio-system for unraveling novel mechanisms for survival under seasonal climate change and combination of temperature extremes, low water and nutrient availability and high salinity and radiation levels. The study of the desert plant Zygophyllum dumosum boiss in its the natural habitat of the Negev desert revealed that stress tolerance is achieved by a plethora of mechanisms (e.g. morphological, molecular and developmental mechanisms), which are probably regulated by multiple genes that act together to bring about tolerance of particular interest is the finding that Z. dumosum like other Zygophyllaceae species, most of which inhabit dry and semidry regions of the world, do not possess the repressive epigenetic markers of histone H3 di- and tri-methylated at lysine 9. I'll describe the phenology of the plant, the dynamic of its genome organization and the unique pattern of histone H3 methylation, which could have an adaptive value in variable desert environments.

Speaker Biography

Gideon Grafi [Ph.D.] is a professor of plant biology at the institutes for desert research of the Ben-Gurion University of the Negev, Israel. He received his Ph.D. from the Hebrew University of Jerusalem, faculty of agriculture, where he studied the translational regulation of human beta-interferon by poly (A) tail. Following a postdoctoral study on endoreduplication and the maize retinoblastoma protein at the Brian A. Larkins lab (University of Arizona). He joined in 1996 the department of plant sciences at the Weizmann Institute of Science, Israel, where he studied epigenetics and the control of cellular dedifferentiation in plants. In 2006, he moved to the Ben-Gurion University and his current research interest's center on the significance of dead organs enclosing embryo in seed biology and ecology, mechanisms underlying stress tolerance in desert plants and epigenetics of plant response to stress.

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