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NIR spectroscopy: the gateway to physiology of nutritional traits of the crops (8274)

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Abstract: In spite of recent positive trends in commitments and investments in increasing the nutrition-sensitivity of agriculture, to date, there is still limited evidence that agricultural interventions are benefiting nutrition (macro & micro), the so-called hidden hunger. Extensive genetic variation within large species such as the major cereals can be confidently expected for quality trait improvement not only in grain but stover too. Cereal crop residues or stover are important components of maintenance in crop-ruminant livestock system in many parts of the world. In such scenario, breeding program has the double challenge of improving nutrition with yield resilience in the face of climate change. The breeding to succeed the product profile of productivity with nutrition enrichment must expand the understanding of the functional linkages between environment (E) and management (M) and their interactions (G x E x M) on crop production quantity as well as the main qualities of stover and grain. The case study in post-rainy sorghum cultivar and stay green lines under altered treatment of irrigation, nitrogen and planting density showed many fold complexity in the partitioning cascade and to large extent driven by G x E x M interactions. The research and breeding system as a whole will be expected to seek efficiencies through better use of technological tools, NIRS is one of the rapid, economical and most proven tool to empower large scale measurement of organic component in grain and stover where chemical analysis is time consuming and expensive. In this way we might circumvent a natural tendency for breeding high yield and low production cost to effectively select against the best human nutrition.

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