

IDT6-055 | Yield maintenance under drought: expansive growth and hydraulics also matter in reproductive organs

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Yield maintenance under drought in maize (*Zea mays*) is associated with flowering synchrony which requires the rapid extension of styles and stigma (silks) to be accessible for pollen. We have shown that the control of grain set under moderate water deficits similar to those in the field result from a developmental process linked to the timing of silk growth, in opposition to the common view that abortion is linked to the sugar metabolism in ovaries. A switch to abortion occurs 2-3 days after first silk emergence in water-stressed plants, when silk growth stops simultaneously for all ovary cohorts, and explains abortion rates in different treatments, genotypes and positions on the ear. Analyses of transcripts and metabolites indicate that the first molecular events occur in silks rather than in ovaries, and involve genes

affecting expansive growth rather than sugar metabolism. Sugar availability is preserved in ovaries until the switch to abortion, and the disruption of carbon metabolism only occurs afterwards. Hence, changes in metabolite contents, transcript amounts and enzyme activities involved in ovary sugar metabolism would be a consequence rather than a cause of the beginning of ovary abortion. Patterns of silk growth responses to environment share common features with those of leaf growth, with both kinetic and genetic evidences. These findings have large consequences for breeding drought tolerant maize and for modelling grain yields under drought. Oury et al (2016) *Plant Physiology* 171: 986-996 and 171: 997-1008

Turc et al (2016) *New Phytologist* 212: 377-388

IDT6-056 | An aromatic twist in the quest of biofortification

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Aerobic rice has been an effective strategy to combat drought. However, this technology was not focusing on quality parameters such as micronutrients. Zinc deficiency causes hidden hunger and is the usual target for biofortification. Aroma in rice plays a significant role in enhancing the market value and consumer's preference. Zinc and aroma are highly valued grain quality traits. In the quest of enhancing micronutrients, getting a biofortified, aromatic, aerobic rice variety would be an added advantage. Considering all these factors, a study was conducted to dissect the relationship between micronutrients and aroma under aerobic condition using 14 aerobic rice genotypes. All these elite accessions were screened for zinc content and aroma along with yield parameters. Genotypes exhibited significant variation for all traits studied. Sensory evaluation of aroma showed that nine

genotypes were scented and five were non-scented. Azucena, an aromatic variety, had highest zinc content before and after polishing. Among all the tested genotypes *Chittimutyalu* was strongly scented and showed very less loss of Zn after polishing. The top four genotypes for brown rice zinc concentration, which are above the international target, were aromatic lines. AM65, a rice accession in the pipeline as a micronutrient-rich aerobic accession, was highly aromatic. Molecular marker analysis was done by using markers designed specific to gene *LPAAT*. All seven designed markers were monomorphic. Sequencing of the amplicons indicated nucleotide variations in six markers which were associated to aroma and zinc. Our results indicate that there is positive relationship between low moisture, Zn content and grain aroma.