



**Figure 2.** Root traits to optimize resource acquisition in common bean (left), sorghum (middle) and rice (right) when grown in low-input environments. For common bean grown in low-P soils, increased basal root whorl number and longer and denser root hairs were targeted to improve P acquisition efficiency. Proposed selection targets for sorghum grown in drought-prone regions with low-P soils in Sahelian Africa include greater root hair length and density for increased P acquisition, combined with more aerenchyma for decreased carbon cost of root tissue and potentially reduced xylem vessel diameter for increased water use efficiency. Plasticity (GxE) in crown root number (reduced) and lateral root branching at depth (increased) are potential drought adaptive responses. In alternate wet and dry rice agroecosystems, proposed adaptive responses to periodic topsoil fluctuations in water and nutrient content include increased root hair development and plasticity in both crown root number and topsoil lateral root branching (increased upon dry-down), combined with greater beneficial interactions with arbuscular-mycorrhizal fungi. Figure was created with BioRender.com. Common bean drawing is from A. Bezvershenko.