

Hydroxamic acids derived from 2-hydroxy-2H-1,4-benzoxazin-3(4H)-one: Key defense chemicals of cereals

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Many cereals accumulate hydroxamic acids derived from 2-hydroxy-2H-1,4-benzoxazin-3(4H)-one. These benzoxazinoid hydroxamic acids are involved in defense of maize against various lepidopteran pests, most notably the European corn borer, in defense of cereals against various aphid species, and in allelopathy affecting the growth of weeds associated with rye and wheat crops. The role of benzoxazinoid hydroxamic acids in defense against fungal infection is less clear and seems to depend on the nature of the interactions at the plant-fungus interface. Efficient use of benzoxazinoid hydroxamic acids as resistance factors has been limited by the inability to selectively increase their levels at the plant growth stage and the plant tissues where they are mostly needed for a given pest. Although the biosynthesis of benzoxazinoid hydroxamic acids has been elucidated, the genes and mechanisms controlling their differential expression in different plant tissues and along plant ontogeny remain to