

RNA interference (RNAi) has rapidly advanced to become a powerful genetic tool and holds promise to revolutionizing agriculture by providing a strategy for controlling a wide array of crop pests. Numerous studies document RNAi efficacy in achieving silencing in viruses, insects, nematodes and weeds parasitizing crops. In general, host derived pest resistance through RNAi is achieved by genetically transforming host plants with double stranded RNA constructs targeted at essential parasite genes leading to generation of small interfering RNAs (siRNAs). Small interfering RNAs formed in the host are then delivered to the parasite and transported to target cells. Delivery can be oral - worms and insects, viral infections, viruses - or through a vascular connections - parasitic plants, while delivery to target cells is by cell to cell systemic movement of the silencing signal. Despite the overall optimism in generating pest resistant crops through RNAi-mediated silencing, some hurdles have recently begun to emerge. Presently, the main challenge is delivery of sufficient siRNAs, in the right cells, and at the right time to mount; a strong, durable, and broad-spectrum posttranscriptional gene silencing (PTGS) signal. This review highlights the novel strategies available for improving host derived RNAi resistance in downstream applied agriculture.