The ability to introduce virus resistance into susceptible varieties or advanced breeding lines without affecting the intrinsic properties of that cultivar is a key feature that distinguishes transgenic virus resistance from conventional breeding strategies. Breeding relies on hybridization of two parental genotypes, followed by selection of progeny with the desired set of characters with the consequence that many lines are not developed through to commercial cultivars owing to a lack of one or more traits. The ability to incorporate virus resistance into finished varieties has the advantage of enabling the breeder to place greater emphasis on the selection of other more complex traits during the breeding process.

In addition, transgenic resistance provides an alternative source of virus resistance, which is of particular utility when host resistance is either unavailable or only present in a form that is difficult to access. The diversity of strategies for transgenic resistance and the wide range of host–virus combinations for which resistance has been reported suggests that most virus diseases could potentially be controlled by this approach. The level of resistance conferred by transgenic strategies has been reported to be similar to that conferred by host resistance genes, and field trial reports indicate that the resistance is of agronomic value. Once resistance has been introduced into a cultivar, that cultivar can be used in conventional breeding programs to distribute the virus resistance more widely.

2.2. Environmental

The principal benefit to the environment that would arise from the adoption of virus-resistant transgenic crops would be the reduction in the usage of pesticides, applied for the control of arthropod and nematode virus vectors. This in turn would reduce the amount of damage caused to nontarget organisms in the agricultural and nonagricultural environment. Higher levels of pests, such as aphids, could then also be tolerated on crops that would in turn increase the base of the food chain for other organisms, such as farmland birds. There has been concern that the documented decline in the populations of many farmland birds, such as the gray partridge ***(1)*** and others ***(2)***, have been partly brought about by the widespread use of broad spectrum insecticides. Many of the nontarget organisms, such as insect predators like carabid beetles, are also beneficial organisms; and any reduction in damage to these populations (by the reduction of the use of broad spectrum insecticides) could have a consequential effect of further reductions in pesticide use for the control of their prey species.

Additional benefits might include the extension of the use of biological control programs for pests of protected crops in which one problematic pest in a series of pests can only be controlled by chemical means, thereby limiting the