Table 2. Parameters used in seed degeneration risk assessment framework.

Parameter	Description	Biological meaning of values	Default values used
pHS_0	Initial proportion of healthy seed	1=no seed infected 0=all seed infected	0.8 (low starting infection scenarios) 0.2 (high starting infection scenarios)
K	Initial plant population (number)	Population at beginning of season based on planting rate in a small field	100
E	External inoculum	Amount of host/non-host inoculum surrounding a field	0 (absence of external inoculum) 30 (presence of external inoculum)
β	Maximum transmission rate per season	Maximum rate of disease transmission during the season when there are no limiting factors for disease spread	0.02
W^1	Proportional change in infection due to environment	W=1, maximally conducive environmental conditions W=0, environmental conditions that do not support transmission	0.8 (highly disease-conducive weather) 0.2 (marginally disease-conducive weather)
H^2	Proportional change in infection due to host genetic resistance	H=1, highly susceptible H=0, immune	1
$M^{1,2}$	Proportional change in infection rate due to vector management	M=1, indicates no management M=0, indicates vector or pathogen eradication	1
$A^{1,2}$	Proportion diseased plants remaining after roguing	A=1, indicates no roguing A=0, indicates all diseased plants removed	1

G	Seed production rate in healthy plants	Number of seed produced per healthy plant	4
$Z^{1,2}$	Proportional selection against diseased plants (through positive or negative selection)	Z=1, indicates no seed selection Z<1, indicates proportional selection against diseased plants Z=0, indicates complete selection against diseased plants	1
C	Indicates differential seed production in the diseased plants as a proportion of seed production in healthy plants	C=0, indicates no seed production in diseased plants C=1, indicates no difference in seed production between healthy and diseased plants C<1, indicates reduced seed production in diseased plants C>1, indicates increased seed production in diseased plants	0.9
R	Reversion rate	Proportion of diseased plants that produce disease-free seed	0.1
Φ	Proportion certified (or otherwise completely disease-free) seed purchased	ϕ=1, all certified seed ϕ=0, no certified seed	0
Θ	Rate of decline of end of season yield with increasing disease incidence	$0<\theta\leq 0.5$, indicates yield decline slow initially, then increases θ=negative, indicates yield decline is rapid initially, then slows θ=0, indicates constant rate of decline	0.2
γ	Proportional change in effect of disease incidence on yield loss for late season versus early season	γ=0, indicates no yield loss due to late season disease incidence γ=1, indicates no difference between early and late season effects of disease incidence on yield loss	Not used in general models

minY	Minimum yield	Units of yield produced by a severely infected plant	0
maxY	Maximum yield	Units of yield produced by a healthy plant	100

[1] For the stochastic parameters W, M, Z, and A, table entries indicate means, and standard deviations 0.1 and 0.3 were used to represent low and high variability scenarios respectively.

[2] When addressing results, we describe and discuss these management effects in terms of the effectiveness of management implementation, so that all types of management can be considered with 1 indicating complete effectiveness of implementation and 0 indicating complete ineffectiveness. In contrast, for H, M, A, and Z, the model and code are constructed such that 1 indicates no limiting factor for infection processes.