Figure S1: Crop yield performance after 13 (2 week model time iteration) time iterations of the model with and without in-field trees, where the system is additionally subjected to a crop pest and crop disease perturbation between iterations 4 and 5. Plot A shows the difference in yield performance with (red) and without (blue) pest perturbation in the absence of in-field trees. B is equivalent but with in-field trees. Plot C shows the average difference between with and without pest perturbation (plots A and B) in the absence (red) and presence (black) of in field trees. Plot D is the average yield performance with pest perturbation, without trees (red) and with trees (black). Plots E-H are equivalent to A-D but show response to crop disease perturbation. Additional figure details are as Figure 3 main text.

Chart

Description automatically generated

Figure S2: Crop yield performance after 6 (4 week model time iteration) time iterations of the model with and without in-field trees, where the system is additionally subjected to a crop pest and crop disease perturbation during iteration 2. Plot A shows the difference in yield performance with (red) and without (blue) pest perturbation in the absence of in-field trees. B is equivalent but with in-field trees. Plot C shows the average difference between with and without pest perturbation (plots A and B) in the absence (red) and presence (black) of in field trees. Plot D is the average yield performance with pest perturbation, without trees (red) and with trees (black). Plots E-H are equivalent to A-D but show response to crop disease perturbation. Additional figure details are as Figure 3 main text.

Chart

Description automatically generated with medium confidence

Statistical analysis of transition probability high to low state 1 week iteration period

![Text

Description automatically generated]()

Likelihood ratio test for significance of random effect

'log Lik.' 0.5 (df=6)

Statistical analysis of transition probability high to low state 2 week iteration period

![A picture containing text

Description automatically generated]()

Likelihood ratio test for significance of random effect

'log Lik.' 0.5 (df=6)

Statistical analysis of transition probability high to low state 4 week iteration period

![A picture containing text, receipt, screenshot

Description automatically generated]()

Likelihood ratio test for significance of random effect

'log Lik.' 0.5 (df=6)

Statistical analysis of transition probability low to high state 1 week iteration period

![Text, letter

Description automatically generated]()

Likelihood ratio test for significance of random effect

'log Lik.' 0.5 (df=6)

Statistical analysis of transition probability low to high state 2 week iteration period

![Text, letter

Description automatically generated]()

Likelihood ratio test for significance of random effect

'log Lik.' 2.86228e-07 (df=6)

Statistical analysis of transition probability low to high state 4 week iteration period

![A screenshot of a computer

Description automatically generated with medium confidence]()

Likelihood ratio test for significance of random effect

'log Lik.' 5.317477e-07 (df=6)

Chart, histogram

Description automatically generated

Figure S3: Mean transition probabilities of focal agroecosystem components from high to low (a) and low to high (B) state in one weeks’ time, predicted by four experts. Data are also organised with respect to expert identity and presence and absence of in-field trees, on the horizontal axis. Statistical findings corresponding to this plot can be found on pages 3 (plot A) and 6 (plot B) of the SI. N = 8 for all bars except those associated with crop disease where n = 4.

Chart, bar chart, histogram

Description automatically generated

Figure S4: Mean transition probabilities of focal agroecosystem components from high to low (a) and low to high (B) state in two weeks’ time, predicted by four experts. Data are also organised with respect to expert identity and presence and absence of in-field trees, on the horizontal axis. Statistical findings corresponding to this plot can be found on pages 4 (plot A) and 7 (plot B) of the SI. N = 8 for all bars except those associated with crop disease where n = 4.

Chart

Description automatically generated

Figure S5: Mean transition probabilities of focal agroecosystem components from high to low (a) and low to high (B) state in three weeks’ time, predicted by four experts. Data are also organised with respect to expert identity and presence and absence of in-field trees, on the horizontal axis. Statistical findings corresponding to this plot can be found on pages 5 (plot A) and 8 (plot B) of the SI. N = 8 for all bars except those associated with crop disease where n = 4.

Expert/author Biographies

CRT is PhD educated and has 25 years’ experience working in the UK as an ecologist, specialising in agricultural insect-plant interactions and the modelling of consumer-resource interactions using artificial neural networks. He has extensive experience of analysing insect-crop interactions in both the lab and field. He has only specialised in agroforestry in the last three years and in that time has focussed on modelling silvoarable systems and has had one season of field work in English silvoarable.

TS completed his PhD in 2021, researching ecosystem services provided by English silvoarable. During his PhD work he spent several seasons in the field working on an English silvoarable system with a focus on the impact of trees on arable crop pests and pollinators. Prior to his PhD work he was an ecological consultant for 10 years.

AC completed his PhD on agrobiodiversity assessment and management in Italy, 2014. He has five years’ experience (2016-2022) working with English organic arable farmers to conduct on farm field trials. His specialisation is arable crop agronomy, not agroforestry, but he worked closely with agroforestry specialist during his time in England.

WS obtained his PhD from the University of Cambridge in 2014, researching forest ecology and conservation, using remote sensing and spatial analysis. From 2015 to 2020 he assumed dual roles at the University of Cambridge as Senior Programme Officer in Climate Change and Biodiversity at the UN Environment Programme, and Coordinator of Strategic Research Initiative in Global Food Security at the Department of Plant Sciences. He has extensive field experience in Portuguese Dehesa agroforestry and English silvoarable and is principal field researcher for biodiversity data collection at the Wakelyns silvoarable site in England on the EU Agromix project.