

Appendix H: Other Robustness and Specification Checks

This appendix reports the results of additional robustness and specification checks on the main results from estimating versions of eq. (1) in the main text (Table H1).

First, the pesticide use data we obtained from the USGS includes both low and high estimates. Low estimates were used for all prior results, but here we use the high estimates as a check on results. For simplicity, we do not log-adjust the pesticide variables here. Panel A reports these results, and we note that they are very similar to those in Table 2 of the main text. Second, we re-specified the control or counterfactual group to consist of only those counties where SWD is “ever detected” prior to April 2018. Thus, we are now comparing counties with SWD detection (the treated) to counties that are contemporaneously free of SWD, but where SWD will be eventually detected at some point in the future (the control).¹ Results of re-estimating eq. (1) in the main text using this sample are shown in panel B. Note that the sample size has considerably fallen because we are including fewer counties in the control group now. The coefficients on the SWD detection indicator are similar to those in Table 2 in the main text, though slightly attenuated. Third, in place of the agricultural district fixed effects used previously, panel C shows the results when county fixed effects are used instead. SWD detection coefficients are virtually the same as those in Table 2 in the main text. Lastly, in panel D, the weather controls are changed to include the number of days in a year where mean county temperature (the average of maximum and minimum daily temperature) falls within each 3°F

¹ Recall that before the control group was defined as other counties in the same state as an SWD detected county. However, only a fraction of these counties ever experienced initial SWD detection (many remain SWD free to this day, as far as scientists know).

temperature bin: <3°F, 3-6°F, 6-9°F, 9-12°F, ...>87°F. The quadratic precipitation term is still included. Results are nearly identical to those in the baseline specification after making this change.

Table H1: Robustness and Specification Checks on DID Model of SWD Impacts on Pesticide Use

| | (1) Insecticides | (2) Fungicides | (3) Herbicides |
|---|---------------------|--------------------|-------------------|
| <i>Panel A: Using high method pesticide estimates</i> | | | |
| After SWD detection | 8.22*** (2.68) | 11.21*** (1.71) | -0.808 (2.74) |
| R ² | 0.358 | 0.411 | 0.740 |
| Sample size | 22,700 | 22,700 | 22,700 |
| <i>Panel B: Alternative control group: SWD “ever detected” counties</i> | | | |
| After SWD detection | 4.52** (2.13) | 5.99*** (2.28) | -0.048 (1.46) |
| R ² | 0.379 | 0.468 | 0.780 |
| Sample size | 5,931 | 5,931 | 5,931 |
| <i>Panel C: County fixed effects</i> | | | |
| After SWD detection | 7.19*** (2.28) | 9.17*** (1.30) | -0.067 (2.25) |
| R ² | 0.375 | 0.402 | 0.711 |
| Sample size | 22,700 | 22,700 | 22,700 |
| <i>Panel D: Mean temperature bins</i> | | | |
| After SWD detection | 7.71*** (2.35) | 9.35*** (1.52) | -0.015 (1.43) |
| R ² | 0.375 | 0.411 | 0.718 |
| Sample size | 22,700 | 22,700 | 22,700 |
| Weather controls | Yes | Yes | Yes |
| State-year fixed effects | Yes | Yes | Yes |

Notes: each column-panel combination is a separate regression. Panel A uses pesticide estimates from the USGS high method. Panel B restricts the control group to consist of only counties where SWD is detected prior to 2018. Panel C uses county fixed effects in place of agricultural district fixed effects. Panel D uses 3°F-sized mean temperature bins in place of quadratic temperature controls. Weather controls are the same as those in Table 2 in the main text with the exception of panel D. All results except those in panel C also include agricultural district fixed effects. Two-way clustered county and year standard errors reported in parentheses.

*** p<0.01; ** p<0.05; * p<0.10.