Database search

We conducted a systematic search of relevant literature using ISI Web of Knowledge (WoS,

available online). An initial search for literature was conducted in October 2018 using the following Boolean string: (weed\* AND ("cover crop\*" OR "green manure" OR "catch crop\*") AND ("corn" OR "maize" OR "soybean\*")). This resulted in a total of 676 studies that were screened for eligibility based on the following criteria: a.) studies must have been conducted in one of “Corn Belt” states, which were included because they represent contiguous states in the region with generally the largest acreage of corn acres harvested in the most recent years; this includes Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin, b.) studies must have measured weed biomass and/or weed density, and c.) studies must have included a treatment that tested the effects of a winter cover crop planted prior to either corn or soybean against a treatment that included no over-wintered cover crop. From this search, we screened 220 articles for inclusion in the database, where the majority were eliminated based on initial review indicating that they were not relevant based on abstract and title. From these remaining articles, 15 fit our criteria. Extracted data included information pertaining to publication date, geographical location, edaphic and pedological characteristics, and cash/cover crop management choices, including cash/cover crop choice, tillage system, cover crop termination method, and cash/cover crop planting date and density. Our response variables of interest, weed biomass and density, were extracted from paired comparisons of measurements taken in the same crop, with or without the presence of an over-wintered cover crop. Where provided, crop yield data were also extracted from experiments.

Database variables/factors section?

Here we can explain some of the groupings that might need further explanation. Could explain how MAT, MAP, data was extracted. Could explain groupings for the termination methods, time of measurement, etc.

Time of planting & termination was captured for the exact DOY when possible, otherwise month was included.

Make sure we include information about timing of measurement – how we tried to be consistent – tried to get each study to one (final) time point for most experiments. But some sampled at distinctly different points for different weed communities and if that was the case we considered RRs separately. (Fisk study the only one that we ran into this – we may want to remove the perennials)

Statistical analysis

Will need to explain how we created response ratios. Note that we have performed an unweighted meta-analysis because most studies either did not report variances for weeds and many had similar numbers of replications.

Response ratios were grouped, where possible, by site-year-treatment only if they reported data in this way. If data was reported as averages across years or treatments they were captured this way in the response ratios. This led to ~150 response ratios from the 15 experiments included in the database.

Used a mixed effects model with a term to account for random effect of study and analyzed with LME4 in R.