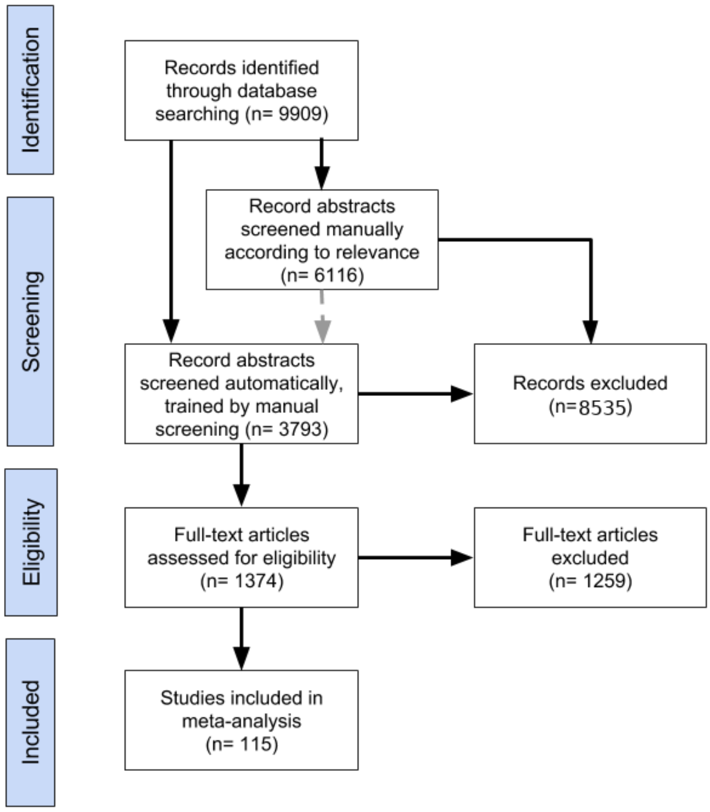
Supporting Information



Appendix S1 | PRISMA diagram. The diagram shows the workflow and the number of studies included in each step of the meta-analysis. We identified studies that measured both species richness and yield in sites with different land-use intensities by performing a literature search. We then screened all abstracts (either manually or automatically) and retained only studies that we could extract information about land-use, species richness, and yield from (see Methods for details).

Appendix S2 | Full Web of Science search term

TOPIC search term:
(((("land use" OR land*use OR (*forest* AND (plantation OR silvicult* OR *cut* OR logg*)) OR agro*forest* OR field* OR farm* OR agricult* OR grassland* OR pasture* OR rangeland OR meadow* OR cropland OR fertiliz* OR pesticid* OR fungicid* OR herbicid* OR irriga*)

AND

(diversity OR species richness OR biodiversity OR (taxonomic AND richness) OR (abundance* AND species) OR even*ess OR shannon OR simpson)

AND

(provisioning OR producti* OR food OR fodder OR feed OR fibre OR logg* OR fuel OR commodit* OR harvest* OR wood OR timber OR coffee OR cacao OR crop* OR yield* OR oil))

NOT

(solar cell OR *polymer* OR genom* OR spectrum OR nano* OR *tpase* OR DNA OR brain OR semicond* OR receptor OR memory OR lymph* OR neuro* OR *electr* OR mitoch* OR *plankton OR optic* OR marrow OR methan* OR clone OR cloning OR protein* OR pharmac* OR RNA OR *blast* OR epithel* OR chromat* OR membra* OR coral OR Cell OR marine OR fish* OR prokaryo* OR ocean* OR *porou* OR cortex OR crystal OR marine OR aerosol* OR hydrolog* OR hexamer OR atom* OR molecule* OR oxida* OR dioxide OR enzyme* OR Bose-Einstein OR *catalyt* OR pacemak* OR mars OR galaxy OR *galact* OR diabet* OR pluto* OR cardi* OR cadmium OR arabidopsis OR sexual OR glacial OR calcium OR ligament OR soil organic carbon OR radiation OR gibberellin* OR 3D OR sensor* OR new species OR hominin OR coast* OR infect* OR meta-analys* OR transpiration OR scenario* OR projected OR soil-rock OR termite-fungus OR termitomyces OR pathogenicity OR panicle OR rainwater harvesting OR crown architecture OR xray OR tomography OR household OR recycling OR imaging OR during succession OR ball* OR root rot OR trichoderma harzianum OR isolation trails OR pot experiment OR cloud immersion OR pimp OR radioactive contamination OR Chernobyl OR radiocaesium OR ragweed OR bruise OR machine vision OR plasma OR insulin OR linoleic OR infest* OR galling OR glucosid* OR allel* OR blood OR radial OR poison* OR milk OR subsurface OR evapotranspiration OR phytotron OR CH4 OR inflow OR detergent OR styrox OR ewe OR p resorption OR bull* OR pig production OR wean* OR diarrhoea OR prototype OR energy waste OR group discussion OR computer runs OR land-classification strategies OR household OR interview OR flav* OR jena experiment)))

***NOT* in TITLE:**
((model* OR wastewater OR contamination OR equation OR groundwater OR coefficient OR pore OR learning OR innovation OR flux* OR niche* OR demograph* OR urban* OR rehabilitat* OR cognit* OR stress* OR knowledge OR

therapy OR somatic OR mining OR mineral* OR tool OR simula* OR fan OR sprayer OR bench OR poverty OR an index OR a new index OR bureaucra* OR epidem* OR review* OR synthes* OR disease OR infect* OR School OR teach* OR MRI OR *informatic* OR radio* OR vector OR labor* OR power OR depression OR kitchen OR *remediat* OR cranium OR river OR lake OR burrow* OR litter OR *algebra* OR industry OR earthquake OR elephant OR radio* OR wheel OR rail OR thrust OR ray OR program OR account* OR perceiv* OR percept* OR incent* OR debate* OR future OR view OR female* OR male* OR greenhouse* OR xylem OR phloem OR hydroponic* OR endophy* OR math* OR signal* OR embryo* OR anatom* OR allelopath* OR opinion* OR capital* OR enterpris* OR compound* OR trout OR plastic OR discharg* OR advice OR stoichiometr* OR iodine OR involucr* OR N-15* OR mutualism OR wildfire* OR volatile OR emmission* OR climate zoning OR ordination OR ration OR slaughtered OR force OR break* OR protogynous OR out-crossed OR outcrossed OR comment* OR forecast* OR aquat* OR probability OR prediction))

***NOT* in PUBLICATION NAME:**
((“PLANT DISEASE” OR “NUTRIENT CYCLING IN AGROECOSYSTEMS” OR “WEED TECHNOLOGY” OR “WEED TECHNOLOGY” OR “WEED RESEARCH” OR “SOIL SCIENCE SOCIETY OF AMERICA JOURNAL“ OR “EURASIAN SOIL SCIENCE” OR “TREE PHYSIOLOGY” OR “TREES STRUCTURE AND FUNCTION” OR CHEMOSPHERE OR “TRANSACTIONS OF THE ASAE” OR soil tillage OR “Economic Botany” OR “trends in ecology” OR opinions OR policy OR philosophical OR “LAND USE POLICY”))

Refined by:

Timespan=1990-2014
Search language=Auto
RESEARCH DOMAINS=(SCIENCE TECHNOLOGY) AND [excluding] DOCUMENT TYPES=(ABSTRACT OR CORRECTION OR BIOGRAPHY OR MEETING OR BOOK OR OTHER OR BIBLIOGRAPHY OR REVIEW OR LETTER OR REPORT OR ART AND LITERATURE OR EDITORIAL OR NEWS OR CASE REPORT) AND LANGUAGES=(ENGLISH) AND [excluding] LANGUAGES=(SPANISH OR PORTUGUESE OR DANISH OR FRENCH OR CHINESE OR JAPANESE OR SLOVAK OR GERMAN OR CZECH OR AFRIKAANS OR SLOVENIAN OR ESTONIAN) AND RESEARCH AREAS=(ENVIRONMENTAL SCIENCES ECOLOGY OR AGRICULTURE OR PLANT SCIENCES OR SCIENCE TECHNOLOGY OTHER TOPICS OR FORESTRY OR EVOLUTIONARY BIOLOGY OR BIODIVERSITY CONSERVATION OR LIFE SCIENCES BIOMEDICINE OTHER TOPICS) AND [excluding] RESEARCH AREAS=(CHEMISTRY OR MARINE FRESHWATER BIOLOGY OR MATERIALS SCIENCE OR ENGINEERING OR BIOCHEMISTRY MOLECULAR BIOLOGY OR GENETICS HEREDITY OR FOOD SCIENCE TECHNOLOGY OR WATER RESOURCES OR ZOOLOGY OR PHYSICS OR BIOTECHNOLOGY APPLIED MICROBIOLOGY OR METEOROLOGY ATMOSPHERIC SCIENCES OR GEOLOGY OR ENERGY FUELS OR OCEANOGRAPHY OR PHYSICAL GEOGRAPHY OR TOXICOLOGY OR BUSINESS ECONOMICS OR VETERINARY SCIENCES OR PUBLIC ENVIRONMENTAL OCCUPATIONAL HEALTH OR PHARMACOLOGY PHARMACY OR MICROBIOLOGY OR CELL BIOLOGY OR MATHEMATICAL

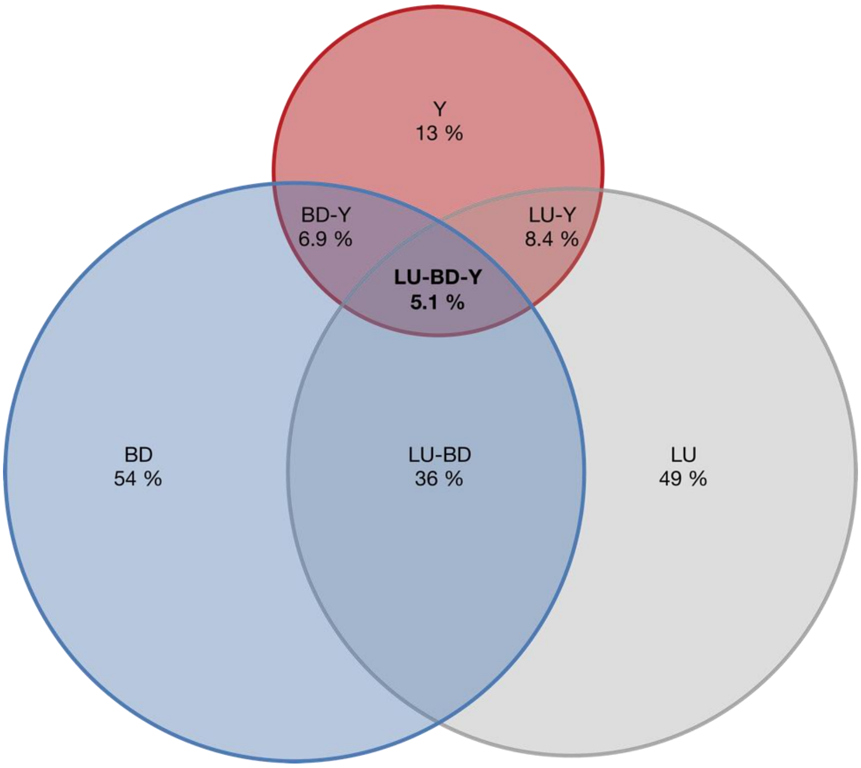
COMPUTATIONAL BIOLOGY) AND [excluding] RESEARCH AREAS=(BIOPHYSICS OR DEMOGRAPHY OR RADIOLOGY NUCLEAR MEDICINE MEDICAL IMAGING OR PSYCHOLOGY OR REPRODUCTIVE BIOLOGY OR ARCHITECTURE OR PHYSIOLOGY OR INFORMATION SCIENCE LIBRARY SCIENCE OR HISTORY PHILOSOPHY OF SCIENCE OR OPTICS OR MICROSCOPY OR DEVELOPMENTAL BIOLOGY OR ANATOMY MORPHOLOGY OR MINING MINERAL PROCESSING OR RESEARCH EXPERIMENTAL MEDICINE OR COMMUNICATION OR ENTOMOLOGY OR MYCOLOGY OR PATHOLOGY OR ANTHROPOLOGY OR INTERNATIONAL RELATIONS OR NEUROSCIENCES NEUROLOGY OR REMOTE SENSING OR SOCIAL SCIENCES OTHER TOPICS OR CONSTRUCTION BUILDING TECHNOLOGY OR PALEONTOLOGY OR NUCLEAR SCIENCE TECHNOLOGY OR INSTRUMENTS INSTRUMENTATION OR IMAGING SCIENCE PHOTOGRAPHIC TECHNOLOGY OR FISHERIES OR GENERAL INTERNAL MEDICINE OR GEOGRAPHY OR GOVERNMENT LAW OR PHILOSOPHY OR URBAN STUDIES OR ENDOCRINOLOGY METABOLISM OR SOCIAL ISSUES OR COMPUTER SCIENCE OR EDUCATION EDUCATIONAL RESEARCH OR IMMUNOLOGY OR SOCIOLOGY OR TRANSPORTATION OR ARTS HUMANITIES OTHER TOPICS OR PUBLIC ADMINISTRATION OR HISTORY OR LITERATURE OR MATHEMATICS)

Appendix S3 | Characterization of land-use intensity classes. The land-use intensity classes "low", "medium" and "high" were characterized separately for the three product groups "crops", "green fodder" and "wood". Land-use intensity was associated to a certain class based on core aspects of land-use (e.g. fertilizer application, grazing regime, species management). This was done separately for each product type.

Land-use intensity	Crops	Green fodder	Wood
Low	• biological pest control • no fertilization • rotational cultivation, possibly with fallow year, natural irrigation	• biological pest control • no fertilization • low density grazing, no signs of overgrazing • occasional mowing • no addition/removal of species	• either combination of or low selective and partial logging • no fertilization • low levels of thinning, heterogeneous age structure, naturally developing forest, usually multiple species forest
Medium	• targeted pesticides • natural fertilization • monocultures single harvest per year, occasional man-made irrigation	• targeted pesticides • natural fertilization • medium density grazing, no signs of overgrazing • regular mowing • some addition/removal of species	• selective or partial logging in whole forest area • natural fertilizer • conventional thinning, removal of non-production trees/understorey, homogeneous age structure, managed natural forests/low intensity plantation forest
High	• non-targeted pesticides • chemical fertilization • monocultures multiple harvests per year; prolonged man made irrigation	• non-targeted pesticides • chemical fertilization • high density grazing, signs of overgrazing • regular mowing, multiple harvest/year • addition/removal of species, monocultures	• clear cut • chemical fertilization, • chemical thinning, very high levels of thinning, plantation of exotic species, homogenous age/species structure, removal of understorey

Appendix S4 | Description of data used in the analysis. Overview and meta-data of the variables either coded directly from the studies or extracted from external data sources and used in the analysis.

Variable	Description
Study Case	Each study-case corresponds to a unique set of response statistics. Hence, a single study can include multiple cases if it reports on more than two land-use intensities, species groups, or products, or if it reports on several locations that differ in covariates, e.g. climate.
Longitude/Latitude	The geographic location of a study either as directly reported by the authors or, if missing, georeferenced by the coders based on a location description.
Intensification step	Level of baseline and increased land-use intensity class based on the classification shown in Box 1. The intensity classes "low", "medium" and "high" were used to form pairs ("[initial]-[final]") of intensification steps ("low-low", "low-medium", "medium-medium", "medium-high", "high-high" and "low-high").
Species group	Broad class of species group, i.e. vertebrates, invertebrates, and plants.
Product	Broad class of harvested product, i.e. crop, green fodder, and wood.
Climate	Broad climate zone according to the Köppen-Geiger climate classification (Appendix S10), i.e. polar, cold (continental), temperate, arid, and tropical.
Land-use history	Broad class of time of first significant use (Appendix S6), i.e. 5950 BC, 50 BC, 1450, 1950, after 1950. And categorized according to the major developments of agriculture (see Methods for details on the classification).
Dependency of yield and species richness measure	An indication of whether species richness and yield are measured from the same species group, in which case species richness and production are considered to be "linked" rather than "independent".
Dependency of intensity class and yield measure	An indication of whether land-use intensity step is based on yield, in which case yield is considered to be "linked" to intensity rather than "independent". For example the harvesting technique in forest (e.g. clear cut, selective logging) is used to define the land-use intensity class and also determines the amount of extracted yield.



Appendix S5 | Distribution of manually screened studies containing information on land-use (LU), species richness (BD) and yield (Y). The Euler diagram shows the percentage of studies containing information on land-use, species richness and yield as indicated after manually screening abstracts, titles and keywords of 5061 studies. Size of circles is proportional to the number of paper, percentage of studies. This served as training data-set for automated screening remaining studies using support vector machines (see Methods). Of the 5.1% of studies which provided information from all three aspects (BD-ES-Y) finally only 115 (1.16%) contained codeable information and were included in this meta-analysis.

Appendix S6 | Overview of the five major stages of history land-use applied in the analysis. Numbers given in brackets are species richness/yield cases that fall within one of the land-use history classes.

Land use history class (including all cells with >20% used area)	**Short characterization of land-use intensification**	**World regions of main agricultural area expansion**
Origin of agriculture (Neolithic Revolution), until 5,950 B.C. (n=21/9)	Domestication of the first main crops (emmer, einkorn, wheat, barley, peas, lentils, rice, etc.) and agricultural animals.	The fertile crescent (Levante), China, New Guinea, Central and South America (Andean region)
Expansion of agriculture, 5,950 B.C. - 50 B.C. (n=115/57)	Significant enlargement of agriculture especially in Central and South America, and the Sahel region of Africa, new domesticated crops and animals, cotton in Peru, maize in Central America.	Africa, Europe, Central and South America
Middle Ages, 50 B.C. - 1.450 A.D. (n=35/23)	Further enlargement of agriculture, especially in the temperate and boreal zone in the Old World	Europe, Asia, Africa, Central and South America
Modern agriculture, 1,450 - 1,950 A.D. (n=47/23)	From first technological advances, (e.g. three-field system, exchange of Old World and New World crops, livestock exchange) to the first agricultural revolution (e.g. first machineries, four-field system, artificial fertilizers). Include the beginning of global industrialization of agriculture, broad use of mineral fertilizers and pesticides.	Global
Green Revolution, 1,950 - today (n= 74/36)	New breeds in crops and livestock, genetically modified organism and new pesticides	Global

Appendix S7 | *p*-values for pairwise comparisons of predicted response ratios for land-use history and climate. Comparisons were conducted for species richness and yield with main climate zones according to the Köppen-Geiger climate classification and broad classes of land-use history (see Appendix S9). Beginning with the full model, we then averaged across land-use history classes (or climate) to test pairwise differences in means using *t*-tests with Holm-correction for multiple comparisons.

Species richness and climate

	Temperate	**Tropical**	**Arid**	**Cold (Continental)**
Tropical	<0.001	-	-	-
Arid	<0.001	<0.001	-	-
Cold (continental)	<0.001	0.0036	<0.001	-
Polar	<0.001	0.00043	0.0145	<0.001

Yield and climate

	Temperate	**Tropical**	**Arid**	**Cold (Continental)**
Tropical	0.4215	-	-	-
Arid	0.0237	<0.001	-	-
Cold (continental)	0.8809	0.4182	0.0333	-
Polar	0.3174	0.0062	0.5916	0.3699

Species richness and land-use history

	5950 BC	**50 BC**	**1450**	**1950**
50 BC	<0.001	-	-	-
1450	0.0033		-	-
1950	0.9174	<0.001	0.1199	-
after 1950	<0.001	0.8367	0.8367	<0.001

Yield and land-use history

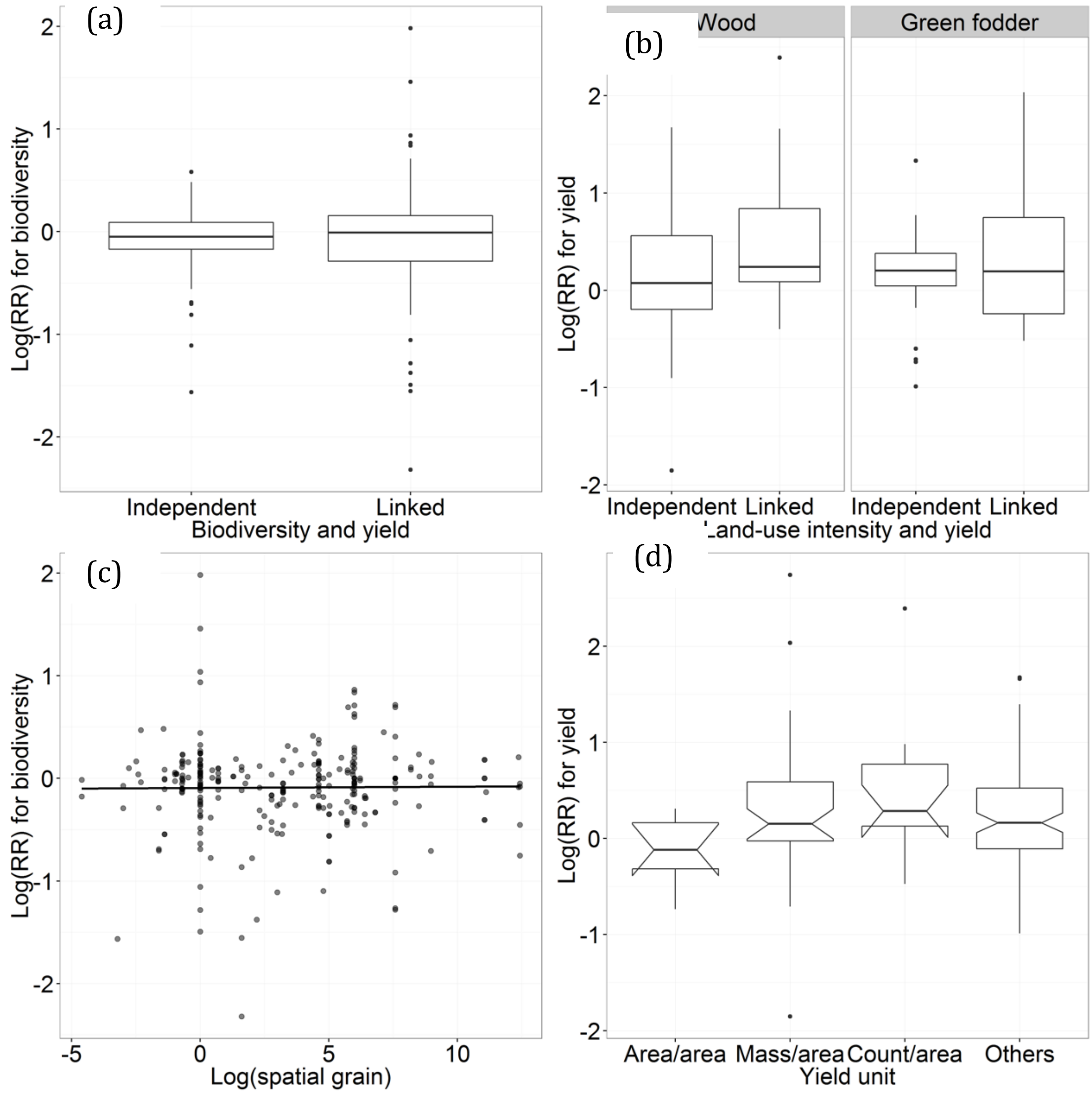
	5950 BC	**50 BC**	**1450**	**1950**
50 BC	<0.001	-	-	-
1450	0.7145	<0.001	-	-
1950	0.5391	0.0069	0.1199	-
after 1950	0.3183	0.0242	0.0460	0.7145

Appendix S8 | Number of samples and percentage change in species richness and yield. Data as shown in Fig. 1 (upper part of the table) and Fig. 2 (lower part of the table) with 95% confidence intervals in response to land-use intensification at different intensification steps, species groups and product types. The differences in cases number n originate from the fact that a study might have measured one type of yield but provides data for several species groups, or vice versa, see also Methods, Extended Data Table 3 and Fig. 1, 2 for further details.

Intensification step	**Species group**	**Product**	**Biodiversity cases *n***	**Species richness percent change [95% confidence interval]**	**Yield *n***	**Studies *n***	**Yield percent change [95% confidence interval]**
Grand mean	NA	NA	292	-8.90 [-14.03,-3.48]	157	115	+20.34 [+8.87,+33.01]
Low-low	NA	NA	16	-0.84 [-7.96,+6.83]	9	9	-0.68 [-16.17,+17.67]
Medium-medium	NA	NA	29	-22.91 [-28.09,-17.35]	19	18	+84.86 [+65.78,+106.13]
High-high	NA	NA	65	-6.12 [-12.52,+0.75]	39	38	+15.18 [+3.12,+28.65]
Low-medium	NA	NA	70	-7.72 [-13.72,-1.29]	37	37	+5.99 [-5.03,+18.29]
Medium-high	NA	NA	81	-6.28 [-12.3,+0.15]	39	38	+24.29 [+11.55,+38.49]
Low-high	NA	NA	31	-12.07 [-25.2,+3.36]	14	14	+28.80 [+7.51,+54.31]
Low-low	Plants	Wood	1	+1.38 [-34.29,+56.41]	3	1	+13.75 [-47.25,+145.27]
Medium-medium	Plants	Wood	12	-23.07 [-32.07,-12.88]	12	8	+107.96 [+76.45,+145.09]
High-high	Plants	Wood	17	+14.63 [-0.73,+32.38]	22	12	-12.42 [-26.13,+3.83]
Low-medium	Plants	Wood	23	-8.59 [-19.18,+3.4]	20	12	+8.75 [-7.74,+28.18]
Medium-high	Plants	Wood	25	+3.54 [-8.41,+17.04]	19	13	+39.75 [+18.63,+64.64]
Low-high	Plants	Wood	14	+5.27 [-17.56,+34.43]	7	6	+66.67 [+4.69,+165.34]
Low-low	Plants	Crop	1	-26.71 [-58.5,+29.45]	1	1	-3.4 [-70.29,+214.14]
Medium-medium	Plants	Crop	1	-22.7 [-61.1,+53.61]	1	1	+0.34 [-70.23,+238.22]
High-high	Plants	Crop	10	-36.96 [-48.66,-22.6]	10	7	+5.28 [-19.1,+36.99]
Low-medium	Plants	Crop	8	-15.71 [-40.65,+19.7]	3	2	+127.53 [+19.37,+333.68]
Medium-high	Plants	Crop	5	-57.83 [-65.73,-48.11]	8	4	+73.84 [+31.85,+129.21]
Low-high	Plants	Crop	1	-54.42 [-72.43,-24.64]	3	1	+13.74 [-16.16,+54.31]
Low-low	Plants	Green fodder	4	+4.91 [-9.44,+21.54]	5	4	+20.89 [-6.12,+55.67]
Medium-medium	Plants	Green fodder	7	-20.05 [-34.86,-1.88]	6	6	+5.08 [-18.29,+35.12]
High-high	Plants	Green fodder	10	-16.78 [-29.13,-2.27]	7	5	+4.22 [-16.99,+30.84]
Low-medium	Plants	Green fodder	21	-5.25 [-17.85,+9.28]	14	12	+36.33 [+9.07,+70.4]
Medium-high	Plants	Green fodder	16	-21.85 [-32.29,-9.8]	12	11	-2.03 [-21.37,+22.06]
Low-high	Plants	Green fodder	5	-6.88 [-32.06,+27.63]	4	3	+33.36 [-23.66,+132.96]
Low-low	Invertebrates	Wood	1	-32.24 [-61.01,+17.75]	3	1	+13.75 [-47.25,+145.27]
Medium-medium	Invertebrates	Wood	4	-3.16 [-22.15,+20.46]	12	2	+107.96 [+76.45,+145.09]
High-high	Invertebrates	Wood	4	+8.53 [-15.16,+38.85]	22	3	-12.42 [-26.13,+3.83]
Low-medium	Invertebrates	Wood	5	+12.19 [-10,+39.86]	20	4	+8.75 [-7.74,+28.18]
Medium-high	Invertebrates	Wood	6	-12.02 [-28.32,+7.98]	19	4	+39.75 [+18.63,+64.64]
Low-high	Invertebrates	Wood	6	-27.87 [-49.05,+2.1]	7	2	+66.67 [+4.69,+165.34]
Low-low	Invertebrates	Crop	1	+18.07 [-37.28,+122.28]	1	1	-3.4 [-70.29,+214.14]

High-high	Invertebrates	Crop	3	+43.84 [+9.86,+88.34]	10	3	+5.28 [-19.1,+36.99]
Medium-high	Invertebrates	Crop	11	-13.63 [-31.04,+8.17]	8	4	+73.84 [+31.85,+129.21]
Low-high	Invertebrates	Crop	4	-24.73 [-48,+8.95]	3	2	+13.74 [-16.16,+54.31]
High-high	Invertebrates	Green fodder	3	-14.15 [-37.96,+18.79]	7	2	+4.22 [-16.99,+30.84]
Low-medium	Invertebrates	Green fodder	1	+26.7 [-8.65,+75.71]	14	1	+36.33 [+9.07,+70.4]
Medium-high	Invertebrates	Green fodder	4	-27.65 [-46.75,-1.69]	12	1	-2.03 [-21.37,+22.06]
Low-high	Invertebrates	Green fodder	1	-30.49 [-56.97,+12.29]	4	1	+33.36 [-23.66,+132.96]
Low-low	Vertebrates	Wood	2	+2.53 [-32.8,+56.45]	3	1	+13.75 [-47.25,+145.27]
Medium-medium	Vertebrates	Wood	5	+7.94 [-12.79,+33.6]	12	3	+107.96 [+76.45,+145.09]
High-high	Vertebrates	Wood	12	-11.02 [-24.94,+5.49]	22	10	-12.42 [-26.13,+3.83]
Low-medium	Vertebrates	Wood	6	+12.12 [-5.7,+33.31]	20	5	+8.75 [-7.74,+28.18]
Medium-high	Vertebrates	Wood	4	+13.28 [-4.29,+34.07]	19	4	+39.75 [+18.63,+64.64]
Low-low	Vertebrates	Crop	1	+24.12 [-29.81,+119.47]	1	1	-3.4 [-70.29,+214.14]
High-high	Vertebrates	Crop	6	-18.07 [-36.83,+6.27]	10	1	+5.28 [-19.1,+36.99]
Low-medium	Vertebrates	Crop	1	+73.1 [+14.87,+160.84]	3	1	+127.53 [+19.37,+333.68]
Medium-high	Vertebrates	Crop	6	-22.74 [-40.17,-0.24]	8	3	+73.84 [+31.85,+129.21]
Low-low	Vertebrates	Green fodder	5	-8.52 [-44.66,51.23]	5	1	+20.89 [-6.12,+55.67]
Low-medium	Vertebrates	Green fodder	5	+0.2 [-39.35,+65.56]	14	1	+36.33 [+9.07,+70.4]
Medium-high	Vertebrates	Green fodder	4	-26.28 [-55.52,+22.2]	12	1	-2.03 [-21.37,+22.06]
Grand mean	Plants	Wood	92	+0.55 [-9.74,+12]	157	52	+20.34 [+8.87,+33.01]
Grand mean	Plants	Crop	26	-38 [-47.84,-26.3]	157	16	+20.34 [+8.87,+33.01]
Grand mean	Plants	Green fodder	63	-11.87 [-23.06,+0.96]	157	41	+20.34 [+8.87,+33.01]
Grand mean	Invertebrates	Wood	26	-7.4 [-22.7,+10.92]	157	16	+20.34 [+8.87,+33.01]
Grand mean	Invertebrates	Crop	19	-0.89 [-18.1,+19.93]	157	10	+20.34 [+8.87,+33.01]
Grand mean	Invertebrates	Green fodder	9	-16.1 [-37.3,+12.26]	157	5	+20.34 [+8.87,+33.01]
Grand mean	Vertebrates	Wood	29	-0.37 [-15.07,+16.86]	157	23	+20.34 [+8.87,+33.01]
Grand mean	Vertebrates	Crop	14	-11.21 [-29.59,+11.96]	157	6	+20.34 [+8.87,+33.01]
Grand mean	Vertebrates	Green fodder	14	-13.94 [-48.22,+43.01]	157	3	+20.34 [+8.87,+33.01]
Low-low	Plants	NA	6	-12.98 [-20.86,-4.32]	9	6	-0.68 [-16.17,+17.67]
Medium-medium	Plants	NA	20	-33.97 [-39.7,-27.7]	19	15	+84.86 [+65.78,+106.13]
High-high	Plants	NA	37	+4.34 [-5.07,+14.7]	39	24	+15.18 [+3.12,+28.65]
Low-medium	Plants	NA	52	-19.96 [-26.75,-12.54]	37	26	+5.99 [-5.03,+18.29]
Medium-high	Plants	NA	46	-15.99 [-23.07,-8.26]	39	28	+24.29 [+11.55,+38.49]
Low-high	Plants	NA	20	+0.1 [-19.04,+23.75]	14	10	+28.8 [+7.51,+54.31]
Low-low	Invertebrates	NA	2	-7.76 [-45.3,+55.54]	9	2	-0.68 [-16.17,+17.67]
Medium-medium	Invertebrates	NA	4	+0.66 [-15.88,+20.45]	19	2	+84.86 [+65.78,+106.13]
High-high	Invertebrates	NA	10	+12.53 [-7.88,+37.45]	39	8	+15.18 [+3.12,+28.65]
Low-medium	Invertebrates	NA	6	+17.76 [-2.24,+41.87]	37	5	+5.99 [-5.03,+18.29]
Medium-high	Invertebrates	NA	21	-8.14 [-21.26,+7.17]	39	9	+24.29 [+11.55,+38.49]
Low-high	Invertebrates	NA	11	-27.57 [-45.49,-3.75]	14	5	+28.8 [+7.51,+54.31]
Low-low	Vertebrates	NA	8	+2.39 [-15.38,+23.87]	9	3	-0.68 [-16.17,+17.67]
Medium-medium	Vertebrates	NA	5	+11.06 [-9.5,+36.29]	19	3	+84.86 [+65.78,+106.13]
High-high	Vertebrates	NA	18	-14.29 [-25.89,-0.88]	39	11	+15.18 [+3.12,+28.65]
Low-medium	Vertebrates	NA	12	+15.77 [-0.16,+34.25]	37	7	+5.99 [-5.03,+18.29]

Medium-high	Vertebrates	NA	14	+9.07 [-5.4,+25.76]	39	8	+24.29 [+11.55,+38.49]
Grand mean	Plants	NA	181	-11.37 [-17.76,-4.48]	157	109	+20.34 [+8.87,+33.01]
Grand mean	Invertebrates	NA	54	-6.72 [-17.15,+5.03]	157	31	+20.34 [+8.87,+33.01]
Grand mean	Vertebrates	NA	57	-2.88 [-14.41,+10.19]	157	32	+20.34 [+8.87,+33.01]
Low-low	NA	Wood	4	-7.49 [-34.61,+30.88]	3	3	+13.75 [-47.25,+145.27]
Medium-medium	NA	Wood	21	-12.83 [-19.84,-5.22]	12	13	+107.96 [+76.45,+145.09]
High-high	NA	Wood	33	-5.42 [-13.27,+3.15]	22	25	-12.42 [-26.13,+3.83]
Low-medium	NA	Wood	34	+2.63 [-5.51,+11.48]	20	21	+8.75 [-7.74,+28.18]
Medium-high	NA	Wood	35	+10.34 [+1.7,+19.71]	19	21	+39.75 [+18.63,+64.64]
Low-high	NA	Wood	20	-3.62 [-18.63,+14.15]	7	8	+66.67 [+4.69,+165.34]
Low-low	NA	Crop	3	+2.78 [-31.4,+54]	1	3	-3.4 [-70.29,+214.14]
Medium-medium	NA	Crop	1	-27.52 [-64.21,+46.77]	1	1	+0.34 [-70.23,+238.22]
High-high	NA	Crop	19	-9.1 [-20.07,+3.37]	10	11	+5.28 [-19.1,+36.99]
Low-medium	NA	Crop	9	+4.53 [-18.78,+34.54]	3	3	+127.53 [+19.37,+333.68]
Medium-high	NA	Crop	22	-38.1 [-45.45,-29.76]	8	11	+73.84 [+31.85,+129.21]
Low-high	NA	Crop	5	-30.96 [-49.78,-5.1]	3	3	+13.74 [-16.16,+54.31]
Low-low	NA	Green fodder	9	+5.9 [-5.74,+18.99]	5	5	+20.89 [-6.12,+55.67]
Medium-medium	NA	Green fodder	7	-19.03 [-32.96,-2.2]	6	6	+5.08 [-18.29,+35.12]
High-high	NA	Green fodder	13	-16.35 [-26.69,-4.55]	7	7	+4.22 [-16.99,+30.84]
Low-medium	NA	Green fodder	27	-3.35 [-13.53+,8.04]	14	14	+36.33 [+9.07,+70.4]
Medium-high	NA	Green fodder	24	-21.67 [-29.96,-12.4]	12	13	-2.03 [-21.37,+22.06]
Low-high	NA	Green fodder	6	-14.65 [-36.68,+15.06]	4	4	+33.36 [-23.66,+132.96]
Grand Mean	NA	Wood	147	-1.59 [-8.81,+6.19]	83	91	+18.59 [+2.98,+36.58]
Grand Mean	NA	Crop	59	-21.24 [-29.91,-11.48]	26	32	+33.26 [+7.35,+65.44]
Grand Mean	NA	Green fodder	86	-12.42 [-21.78,-1.94]	48	49	+14.23 [-5.6,+38.22]



Appendix S9 | Analysis of potentially correlated or confounded variables. Boxplots of mean effect sizes for (**a**) species richness as having been measured from the same (linked, n = 103) or different (independent, n = 217) species group as yield was obtained from, and (**b**) yield as having been linked (n = 96) or independent (n = 224) from land-use intensity in different production systems; (**c**) Scatterplot of mean effect size vs. log of sampled area (n = 449), where the black line indicates the regression line; (**d**) notched boxplots of mean effect sizes for different yield units area/area (n=8), mass/area (n=38), Count/area (n=14), and Others (n=97).

Appendix S10 | Analysis of Shannon diversity

In this appendix, we compute a meta-analysis using a subset of 19 studies out of the 115 studies that provided measures of Shannon diversity (11 studies) or published abundance information that allowed us to compute Shannon diversity (8 studies) in addition to the species richness data used in the main analysis.

Shannon diversity information was extracted analogously to species richness data extraction in the same way as described in the Methods section in the main text. In case authors did not publish Shannon diversity but provided detailed species lists, we used that data to calculate Shannon diversity. We divided the number of individuals of each species recorded at a site by the total number of individuals of all species at that site, multiplied this fraction with its natural log and summed these values for all species per site to get Shannon *H*. Log-response ratios were calculated for each of the intensification pairs we could form within each study (as described in Box 1 in the main text). This way a total of 42 cases could be extracted from the 19 studies. We performed a standard meta-analysis using the software OpenMEE (http://www.cebm.brown.edu/openmee/index.html). This analysis can be regarded as analogous to the "grand mean" analysis for species richness as shown in Figure 2 in the main text.

The results of this meta-analysis are shown in Figure S13. Overall, this analysis finds no significant effect of land-use intensification on Shannon diversity albeit individual study-case combinations show positive or negative of land-use intensification.

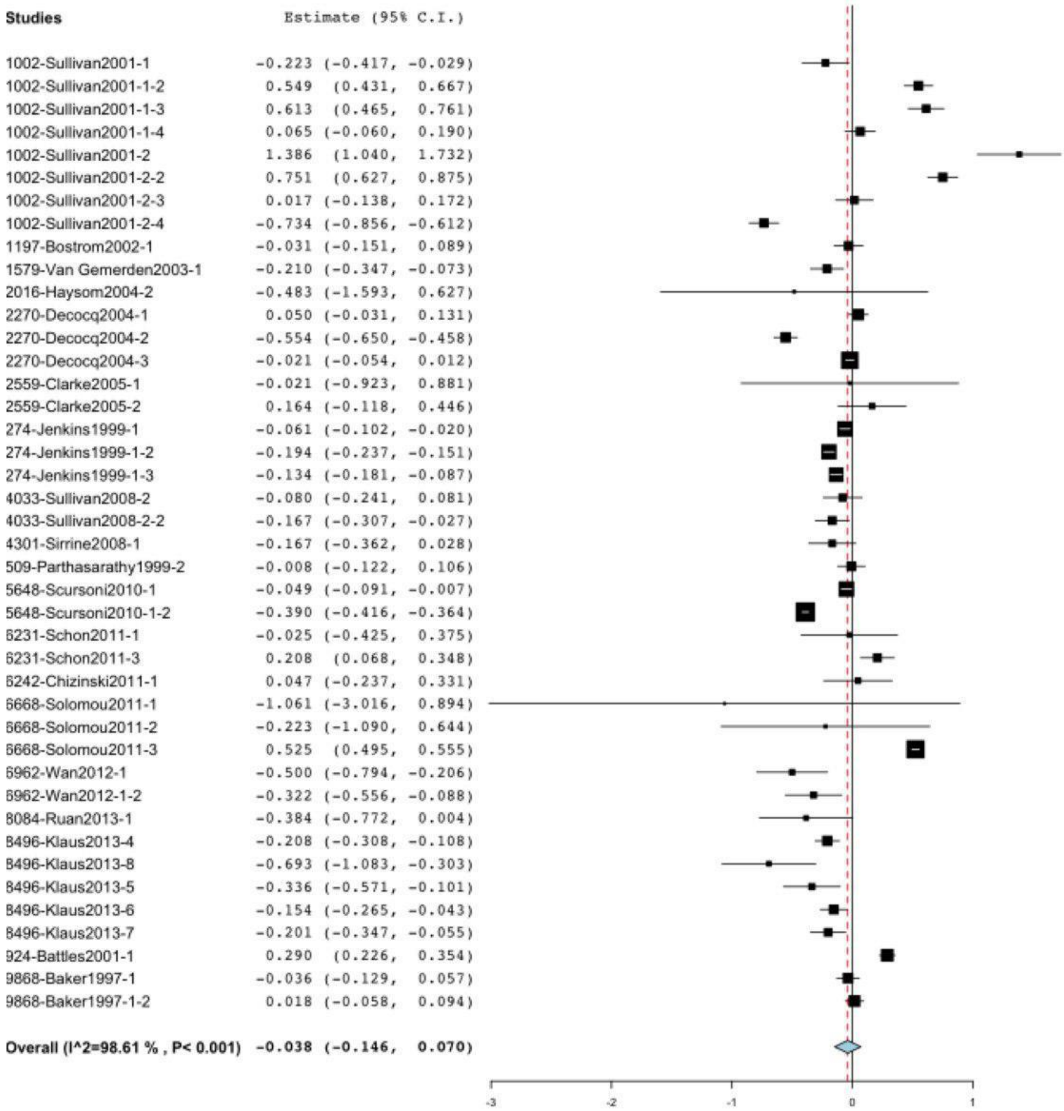
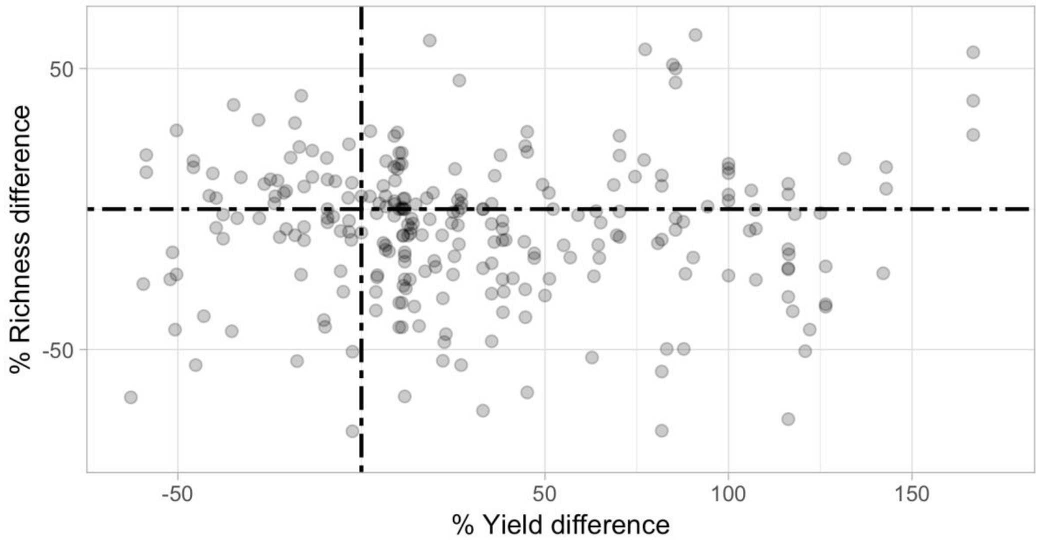


Figure S10 | The effect of land-use intensification on Shannon diversity extracted from a subset of 19 studies (42 intensification cases). The left hand side shows the study-case unique identifier as well as estimates and their 95% confidence intervals. The right hand side of the figure shows a forest plot; squares and vertical points of the diamond show estimates; the area of each square is proportional to each cases' weight in the meta-analysis; error bars and horizontal points of the diamond show 95% confidence intervals.



Appendix S11 | Direct analysis of effect sizes (log response ratios) for % richness differences and % yield differences in response to conventional intensification. Points represent pairs for all potential combinations of yield and richness cases within each of the 115 individual studies included in the main meta-analysis. We analysed the direct relationship between species richness and yield effect sizes using linear mixed-effects meta-analysis models (in R version 3.0.1 using the function rma.mv, in the package metafor version 1.9.8; Viechtbauer, 2010). To avoid problems with co-linearity of effect sizes with moderators used in the main analysis, a simple model was built including only the effect size measures. The model was fitted using case nested within study as random effects to account for dependencies of multiple outcomes within the same study. The direct analysis of effect sizes revealed a non significant relationship (p=0.887) between % richness differences and % yield differences in response to conventional intensification.

Appendix S12 | Additional references used in the meta-analysis

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