Supplementary Materials

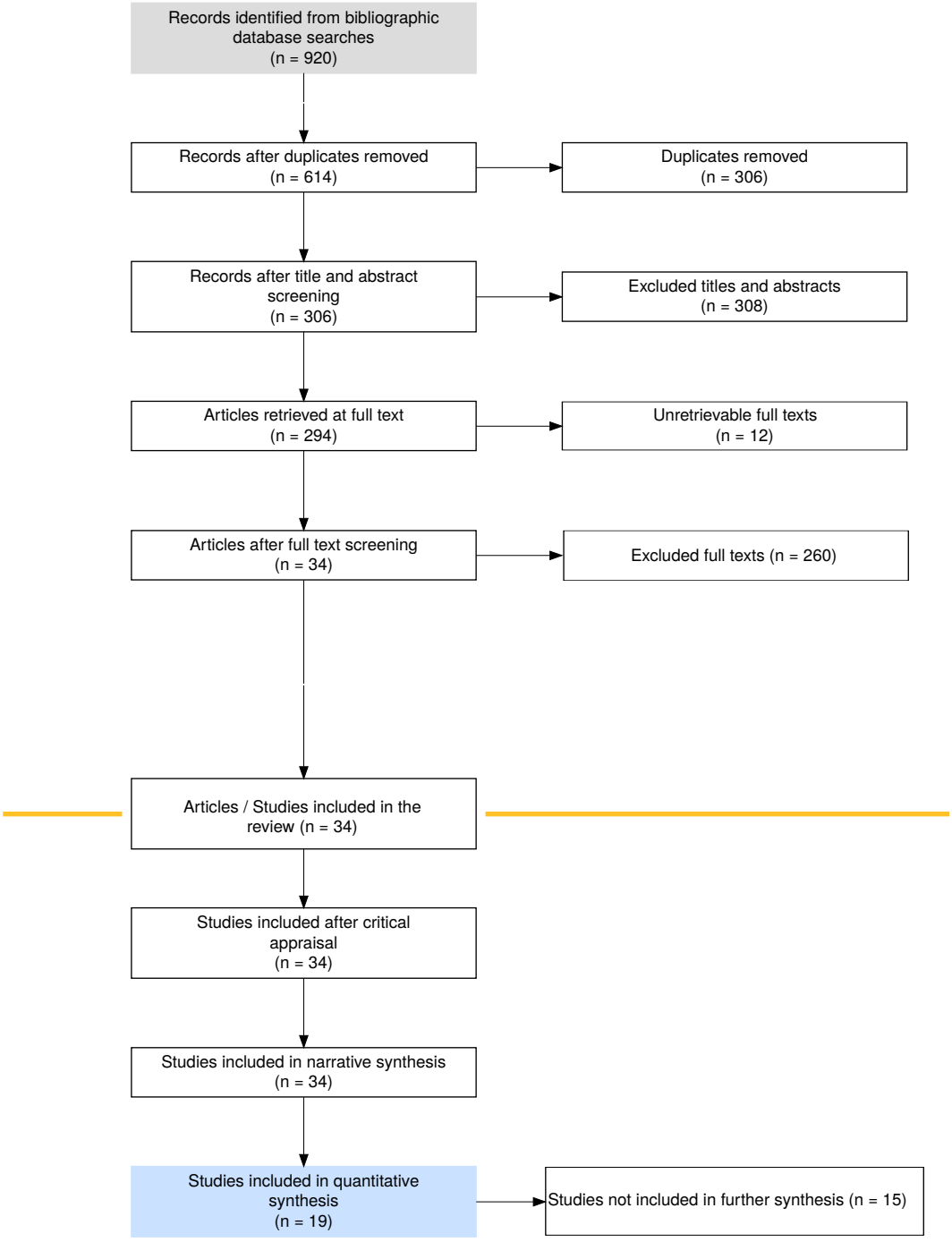

Figure S1. RepOrting standards for Systematic Evidence Syntheses (ROSES) flow diagram for review process of fecal indicator bacteria (FIB) best management practice (BMP) studies.

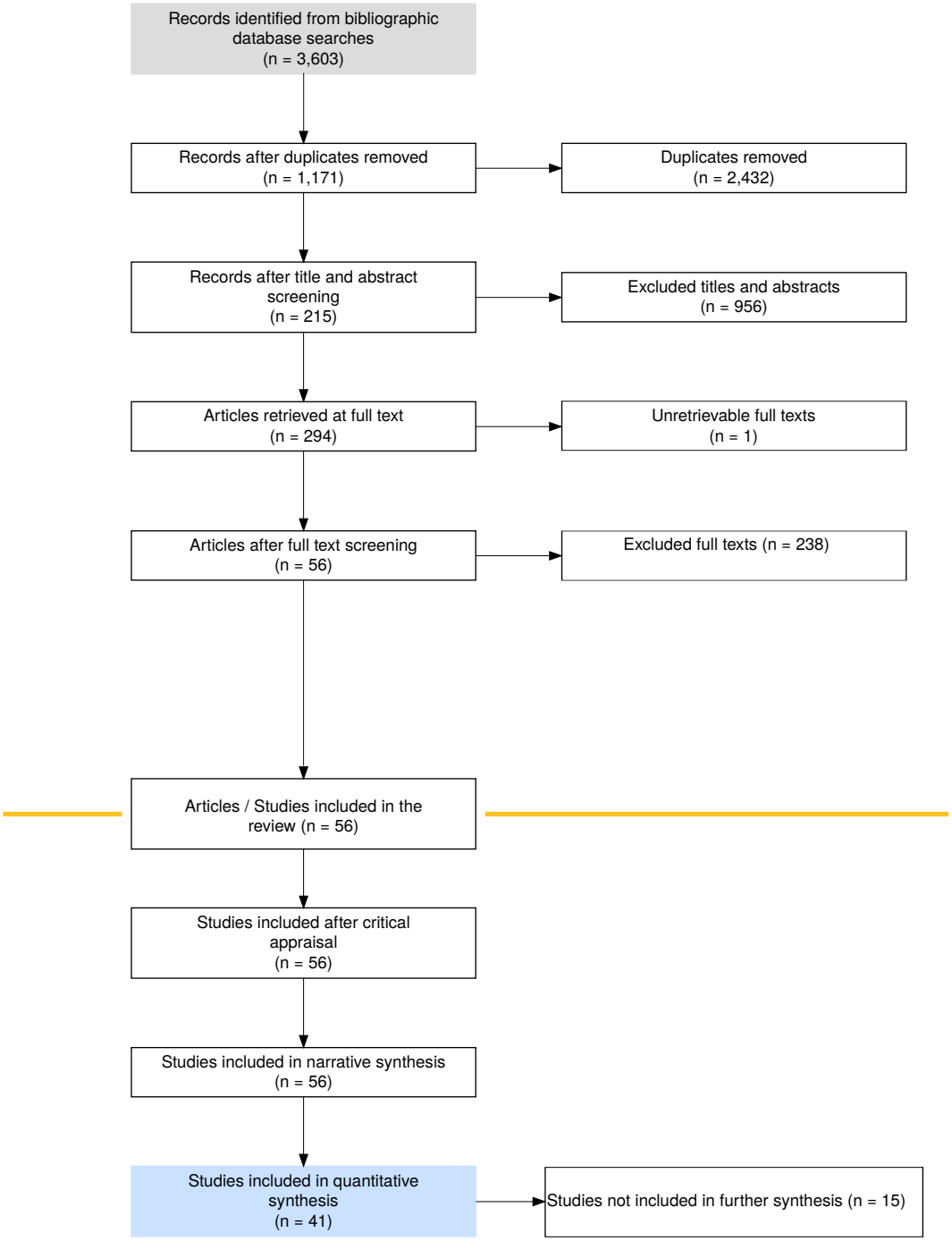

Figure S2. RepOrting standards for Systematic Evidence Syntheses (ROSES) flow diagram for review process of nutrient and sediment best management practice (BMP) studies.

Table S1. Summary table of multilevel random effects model for effect of BMPs on fecal indicator bacteria concentrations.

Moderator	Estimate	95% CI	SE	*T*-statistic	df	*p*-value
Intercept	-2.38	[-4.71,-0.057]	1.04	-2.28	10	0.046
Aridity Index	32.63	[12.57,52.69]	10.00	3.26	53	<0.01
BMP Subcategories						
Infiltration	1.55	[-0.54,3.65]	1.04	1.49	53	0.143
Livestock Management	0.98	[-1.01,2.97]	0.89	1.10	10	0.298
Treatment	1.44	[-0.48,3.36]	0.96	1.50	53	0.138
log(Influent)	0.25	[0.14,0.37]	0.058	4.41	54	<0.01
Aridity:BMP Subcategory Interaction						
Aridity:Infiltration	-29.90	[-50.34,-9.47]	10.19	-2.93	53	<0.01
Aridity:Livestock	-30.37	[-50.93,-9.81]	10.25	-2.96	53	<0.01
Aridity:Treatment	-30.33	[-49.62,-11.03]	9.62	-3.15	53	<0.01

I^2_{total}=20.48, I^2_{study}=0, I^2_{effect}=20.48; R^2_{marginal}=0.89

Table S2. Summary table of multilevel random effects model for effect of BMPs on total nitrogen removal.

Moderator	Estimate	95% CI	SE	*T*-statistic	df	*p*-value
Intercept	0.42	[0.21,0.62]	0.095	4.35	12	<0.01

I^2_{total}=77.12, I^2_{study}=23.2, I^2_{effect}=53.92; R^2_{marginal}=0

Table S3. Summary table of multilevel random effect model for effect of BMPs on inorganic nitrogen removal.

Moderator	Estimate	95% CI	SE	*T*-statistic	df	*p*-value
Intercept	0.64	[-0.078,1.35]	0.33	1.92	13	0.076

I^2_{total}=77.12, I^2_{study}=23.2, I^2_{effect}=53.92; R^2_{marginal}=0

Table S4. Summary table of multilevel random effect model for effect of BMPs on total phosphorus removal.

Moderator	Estimate	95% CI	SE	*T*-statistic	df	*p*-value
Intercept	0.58	[0.14,1.03]	0.21	2.79	15	0.014
log(Influent)	0.23	[-0.035,0.49]	0.13	1.76	35	0.087

I^2_{total}=96.23, I^2_{study}=41.59, I^2_{effect}=54.64; R^2_{marginal}=0.12

Table S5. Summary table of multilevel random effect model for effect of BMPs on PO4 removal.

Moderator	Estimate	95% CI	SE	*T*-statistic	df	*p*-value
Intercept	0.31	[-0.19,0.81]	0.21	1.48	7	0.18
log(Influent)	0.27	[0.085,0.45]	0.088	3.06	19	<0.01

I^2_{total}=96.23, I^2_{study}=41.59, I^2_{effect}=54.64; R^2_{marginal}=0.12

Table S6. Summary table of multilevel random effect model for effect of BMPs on TSS removal.

Moderator	Estimate	95% CI	SE	*T*-statistic	df	*p*-value
Intercept	1.65	[0.96,2.34]	0.31	5.28	11	<0.01

I^2_{total}=99.57, I^2_{study}=0, I^2_{effect}=99.57; R^2_{marginal}=0

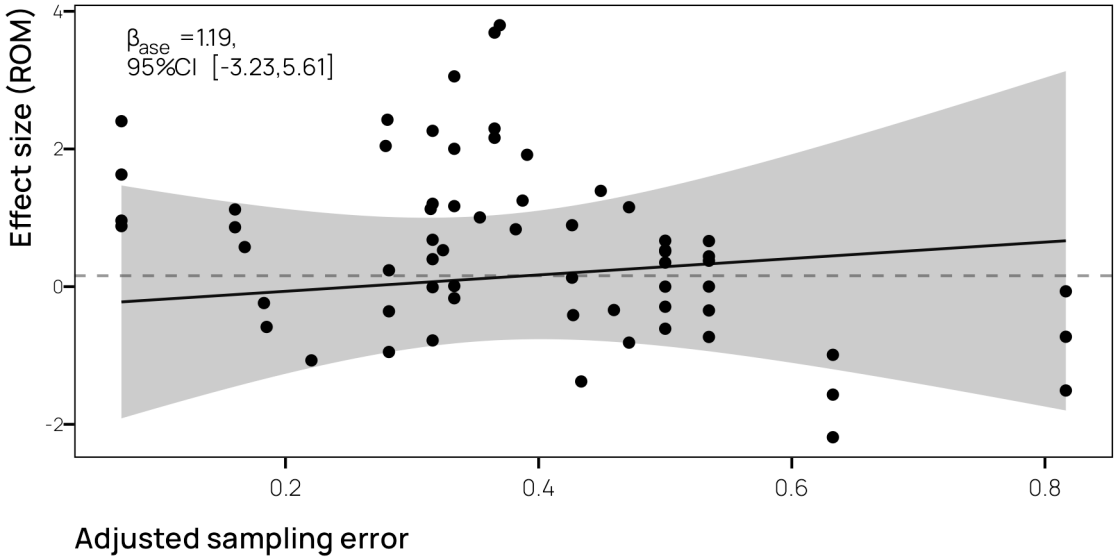

Figure S3. Plot of adjusted sampling error and predicted effect size for FIB multilevel random effects model with moderators. Slope and 95% confidence interval of the adjusted sampling error term is annoted.

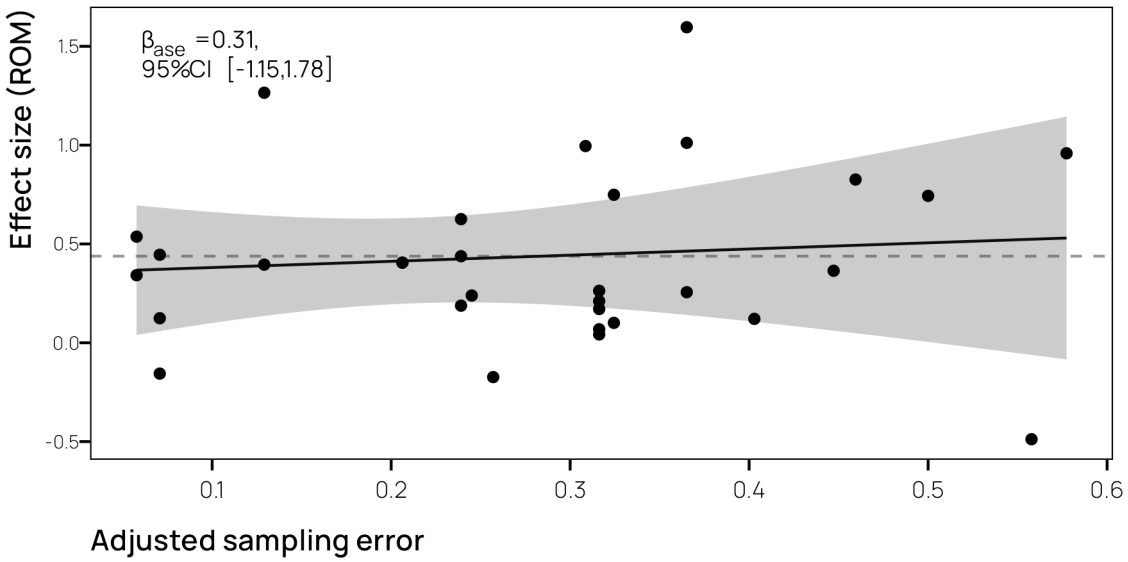

Figure S4. Plot of adjusted sampling error and predicted effect size for TN multilevel random effects model with moderators. Slope and 95% confidence interval of the adjusted sampling error term is annoted.

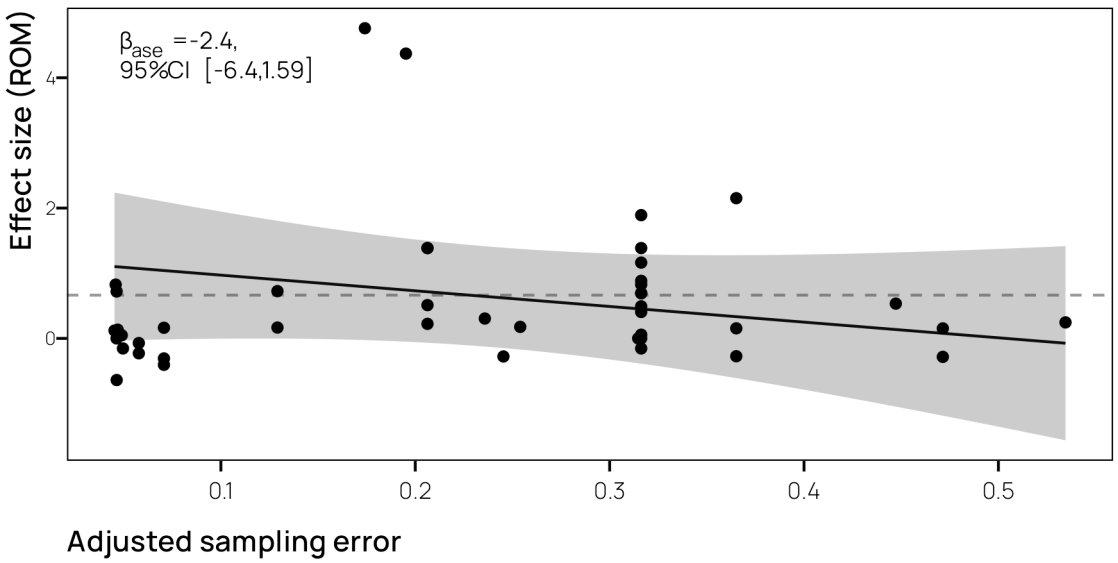

Figure S5. Plot of adjusted sampling error and predicted effect size for DIN multilevel random effects model with moderators. Slope and 95% confidence interval of the adjusted sampling error term is annoted.

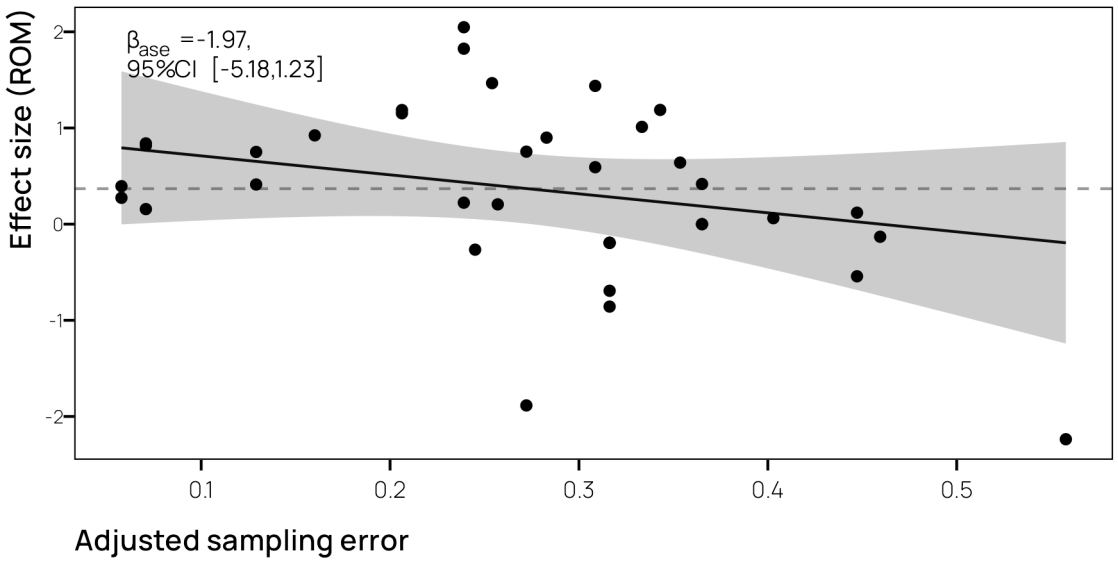

Figure S6. Plot of adjusted sampling error and predicted effect size for TP multilevel random effects model with moderators. Slope and 95% confidence interval of the adjusted sampling error term is annoted.

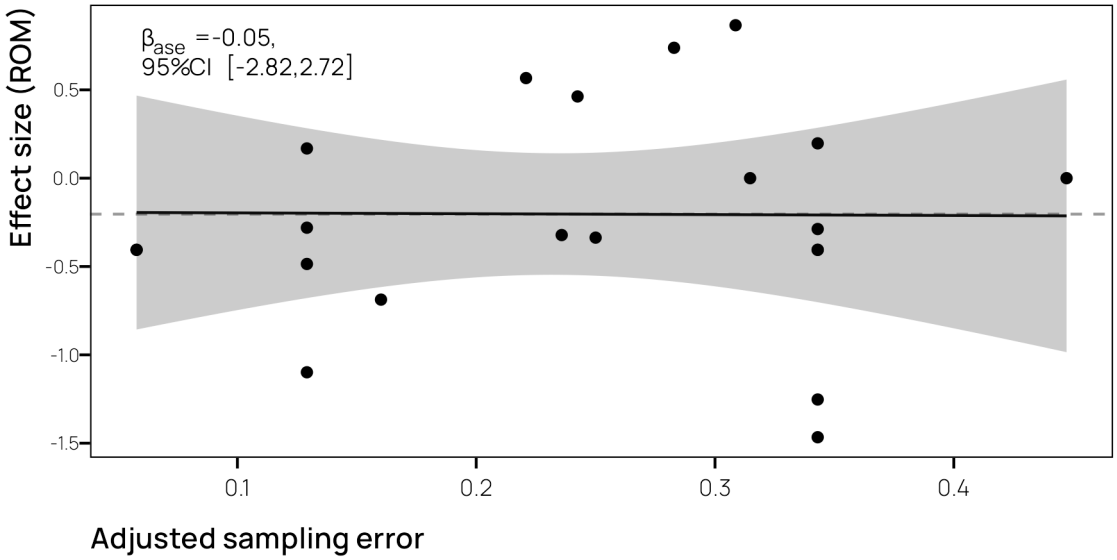

Figure S7. Plot of adjusted sampling error and predicted effect size for PO_4 multilevel random effects model with moderators. Slope and 95% confidence interval of the adjusted sampling error term is annoted.

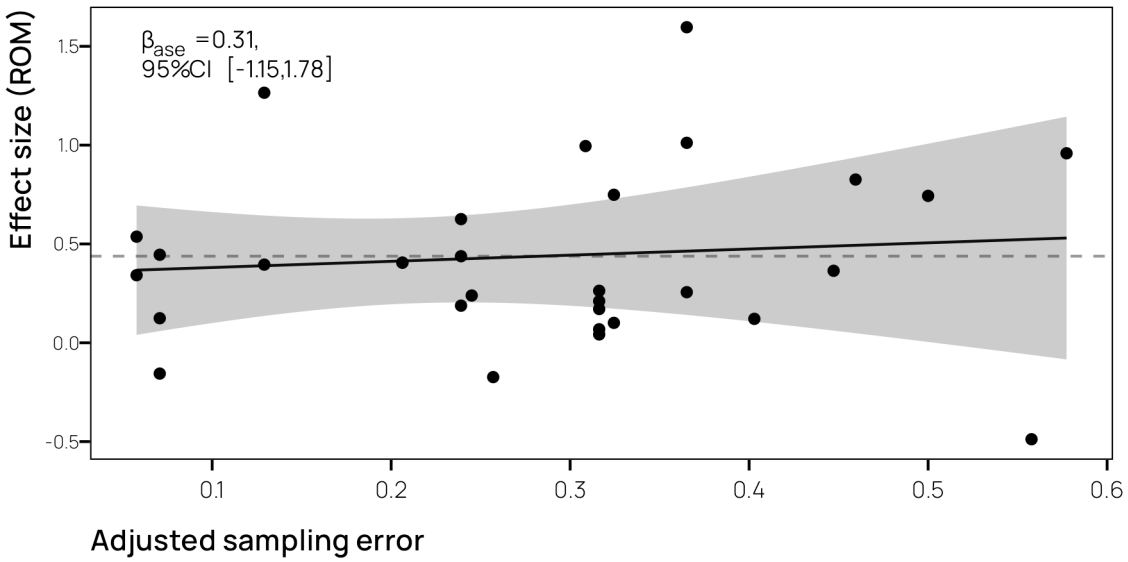

Figure S8. Plot of adjusted sampling error and predicted effect size for TSS multilevel random effects model with moderators. Slope and 95% confidence interval of the adjusted sampling error term is annoted.

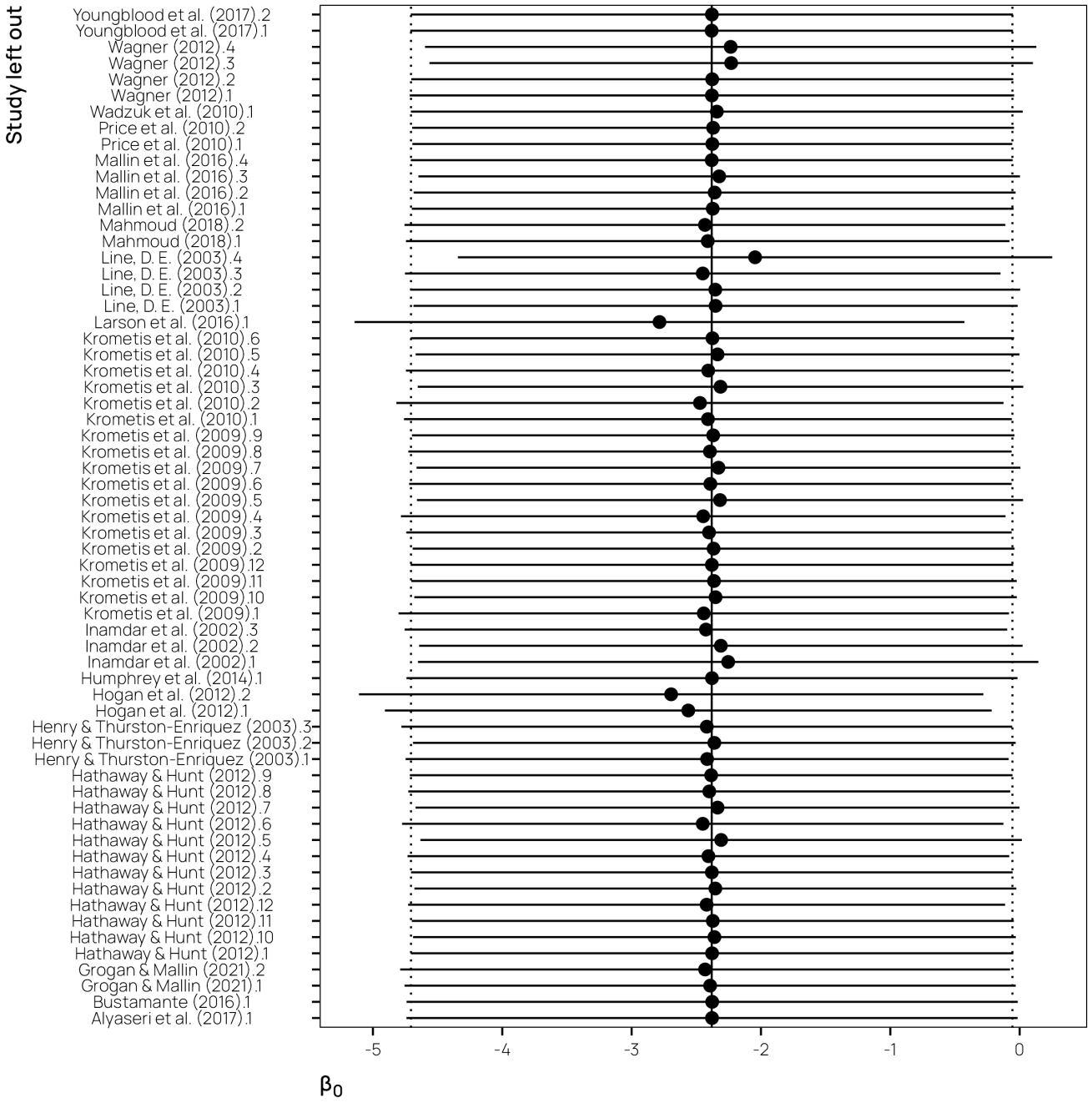

Figure S9. Plot of intercept estimates from sensitivity analysis for the FIB regression model. Individual points are the intercept estimates with 95% confince intervals for the regression model fit leaving out the study value indicated on the y-axis. The vertical solid line and dotted lines indicate the intercept and 95% confidence intervals for the model that includes all values. Any study values outside of the full model confidence intervals would be considered and outlier.

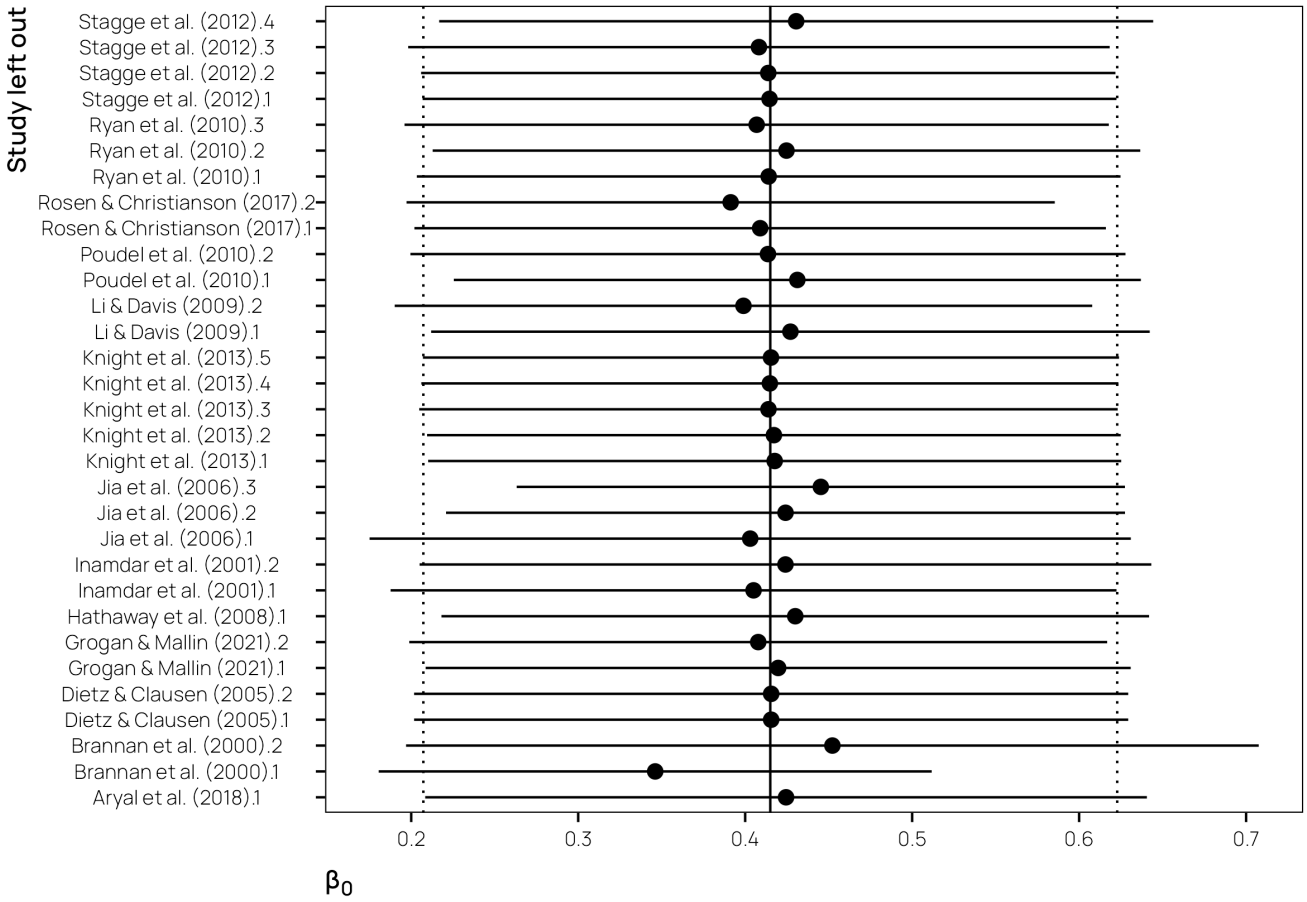

Figure S10. Plot of intercept estimates from sensitivity analysis for the TN regression model. Individual points are the intercept estimates with 95% confince intervals for the regression model fit leaving out the study value indicated on the y-axis. The vertical solid line and dotted lines indicate the intercept and 95% confidence intervals for the model that includes all values. Any study values outside of the full model confidence intervals would be considered and outlier.

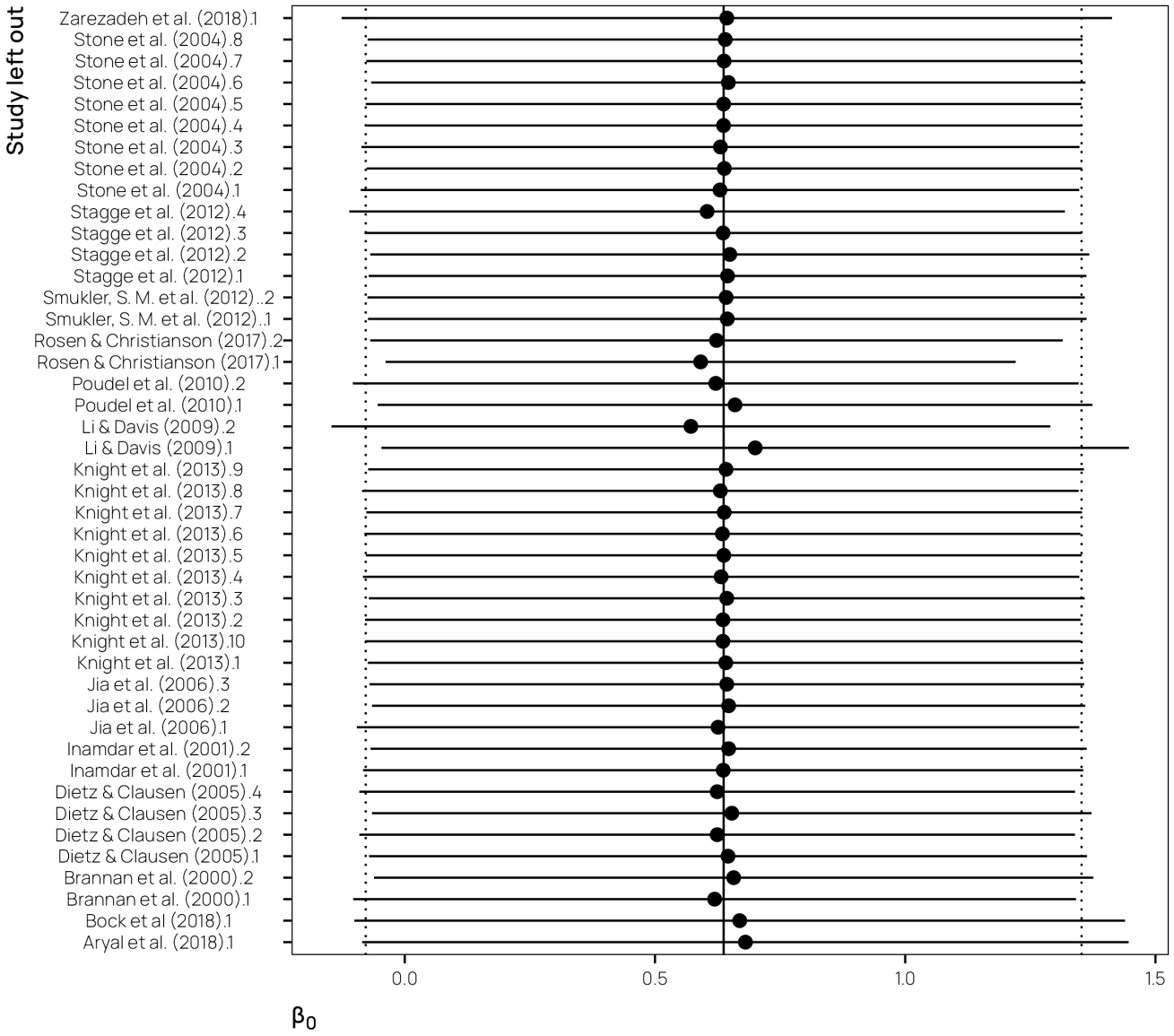

Figure S11. Plot of intercept estimates from sensitivity analysis for the DIN regression model. Individual points are the intercept estimates with 95% confince intervals for the regression model fit leaving out the study value indicated on the y-axis. The vertical solid line and dotted lines indicate the intercept and 95% confidence intervals for the model that includes all values. Any study values outside of the full model confidence intervals would be considered and outlier.

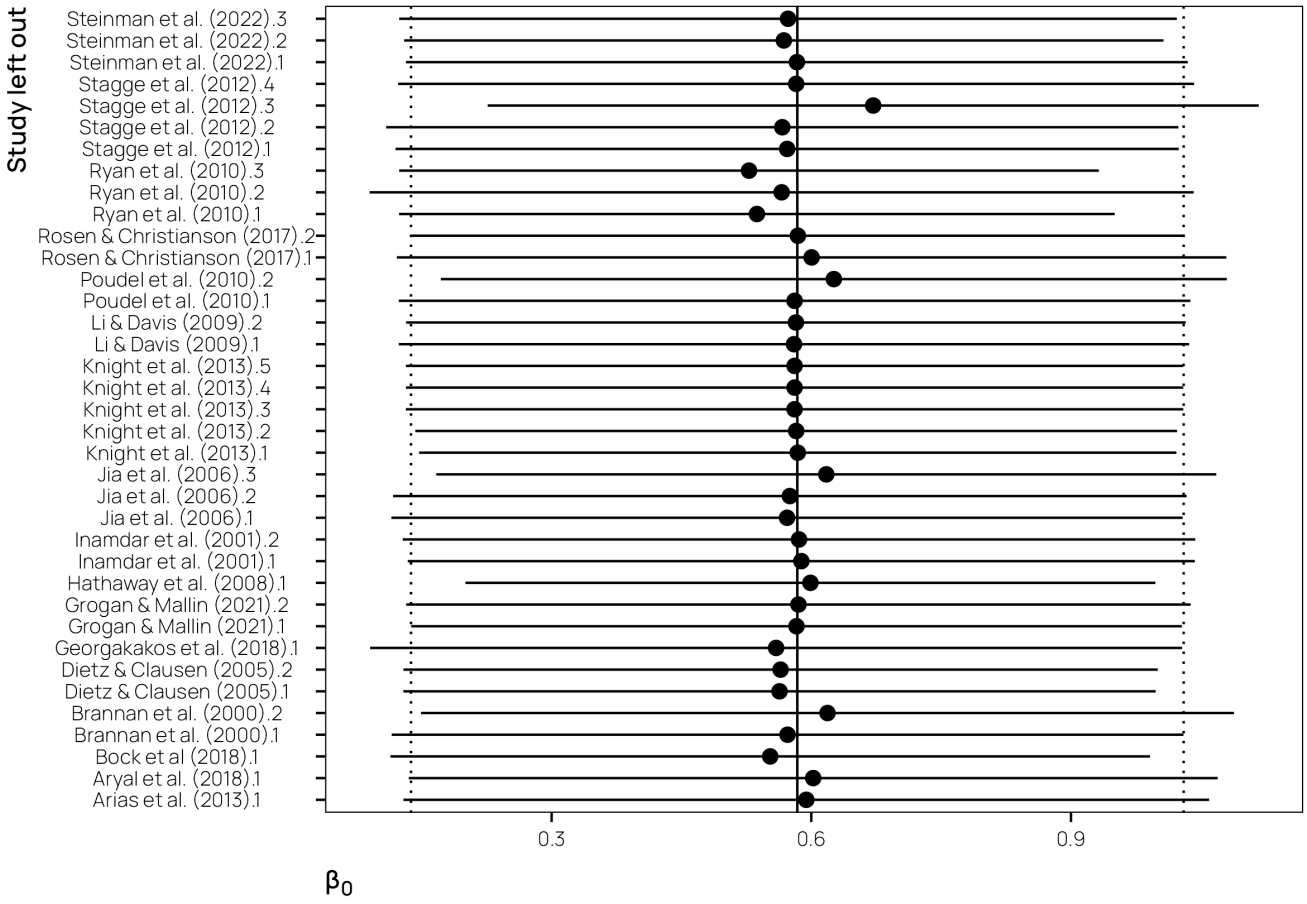

Figure S12. Plot of intercept estimates from sensitivity analysis for the TP regression model. Individual points are the intercept estimates with 95% confince intervals for the regression model fit leaving out the study value indicated on the y-axis. The vertical solid line and dotted lines indicate the intercept and 95% confidence intervals for the model that includes all values. Any study values outside of the full model confidence intervals would be considered and outlier.

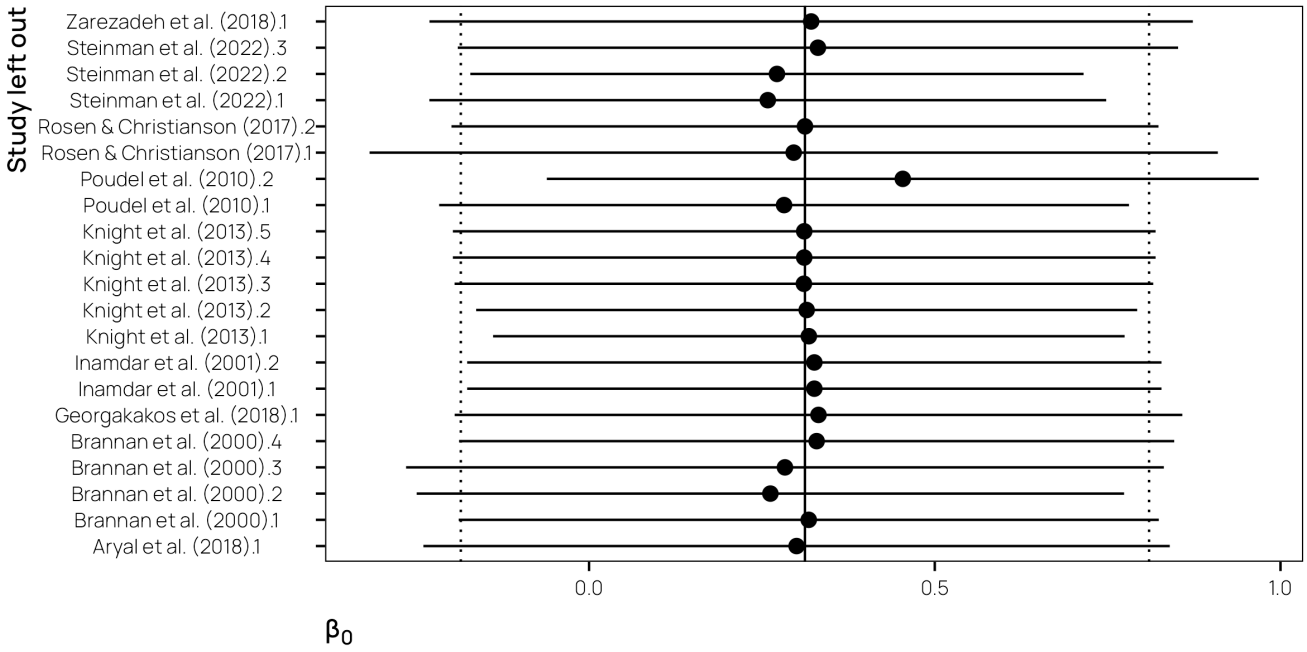

Figure S13. Plot of intercept estimates from sensitivity analysis for the PO_4 regression model. Individual points are the intercept estimates with 95% confince intervals for the regression model fit leaving out the study value indicated on the y-axis. The vertical solid line and dotted lines indicate the intercept and 95% confidence intervals for the model that includes all values. Any study values outside of the full model confidence intervals would be considered and outlier.

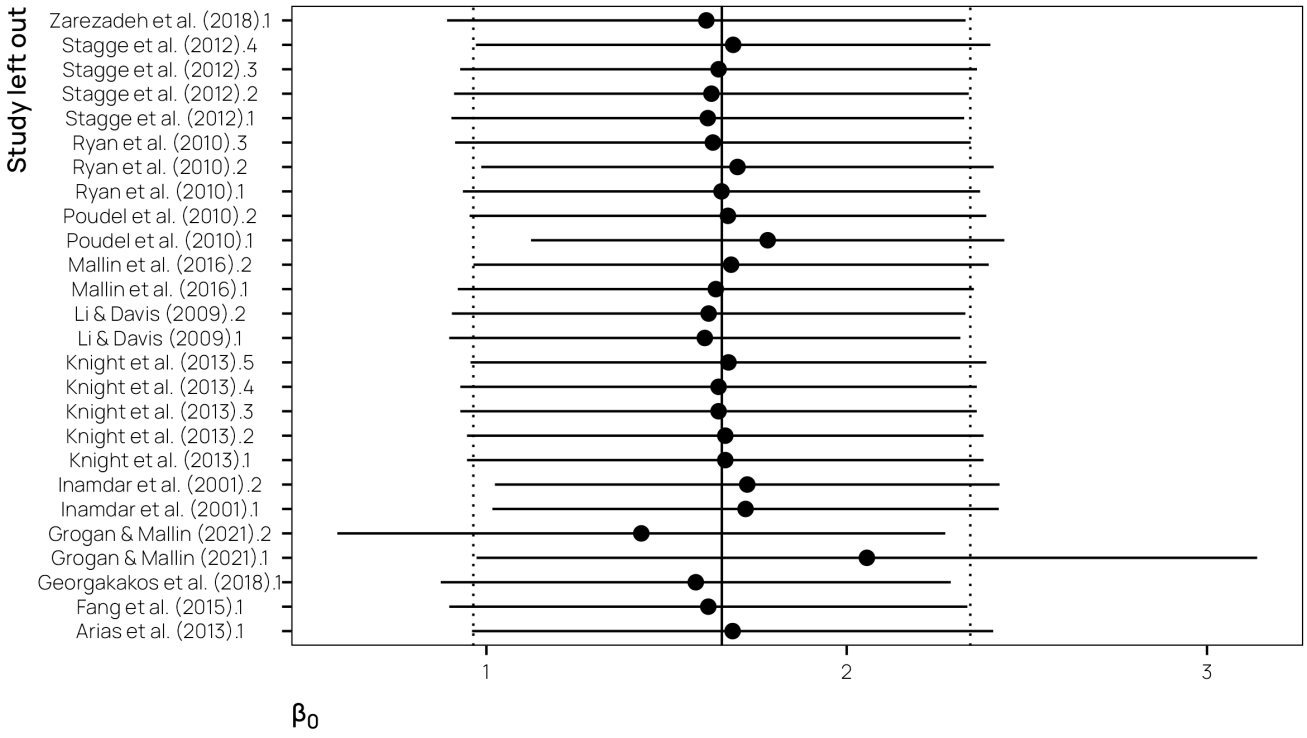

Figure S14. Plot of intercept estimates from sensitivity analysis for the TSS regression model. Individual points are the intercept estimates with 95% confince intervals for the regression model fit leaving out the study value indicated on the y-axis. The vertical solid line and dotted lines indicate the intercept and 95% confidence intervals for the model that includes all values. Any study values outside of the full model confidence intervals would be considered and outlier.

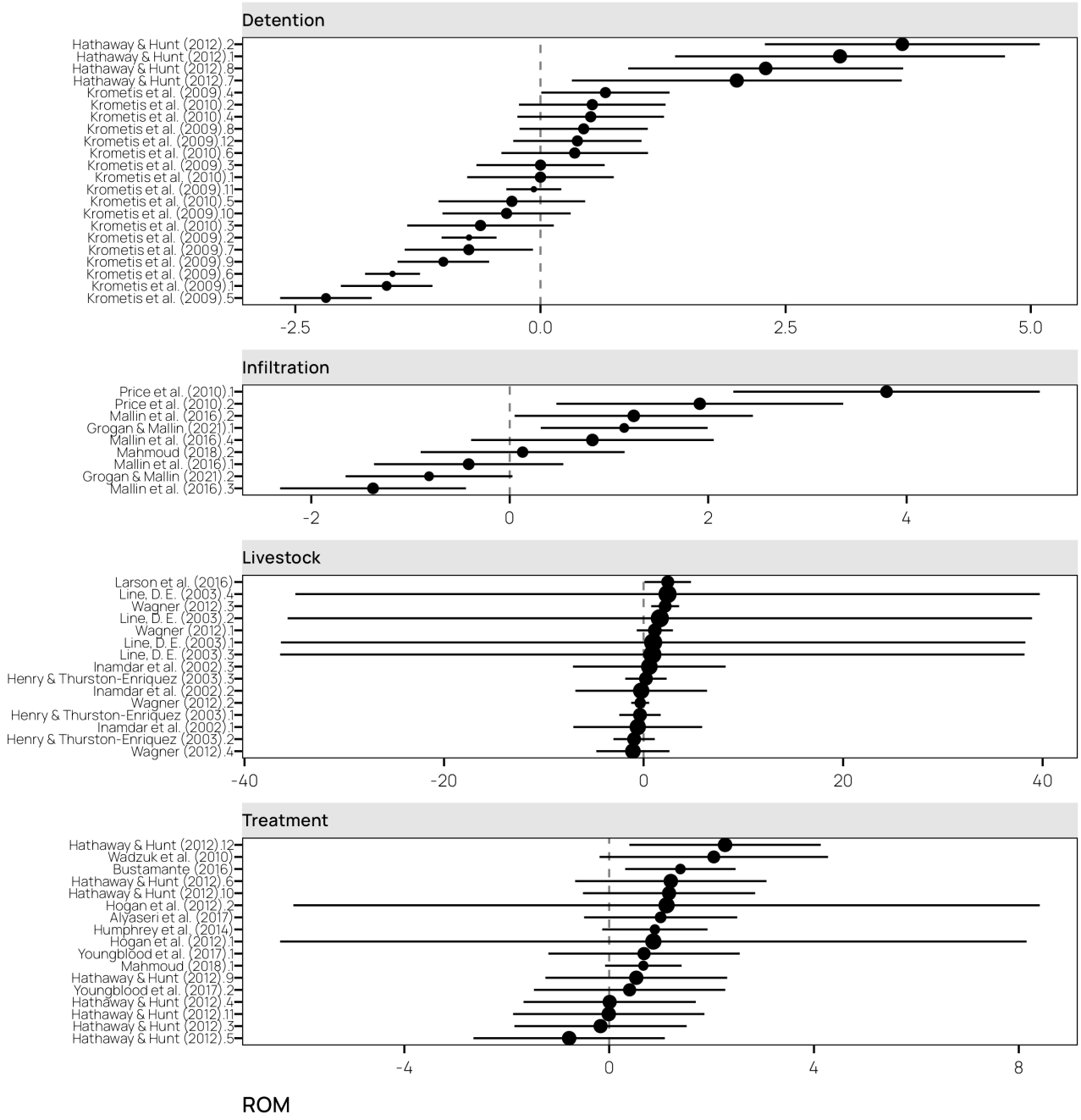

Figure S15. Forest plot of FIB effect size estimates and 95% confidence intervals. Size of points are scaled to inverse of the sampling variance.

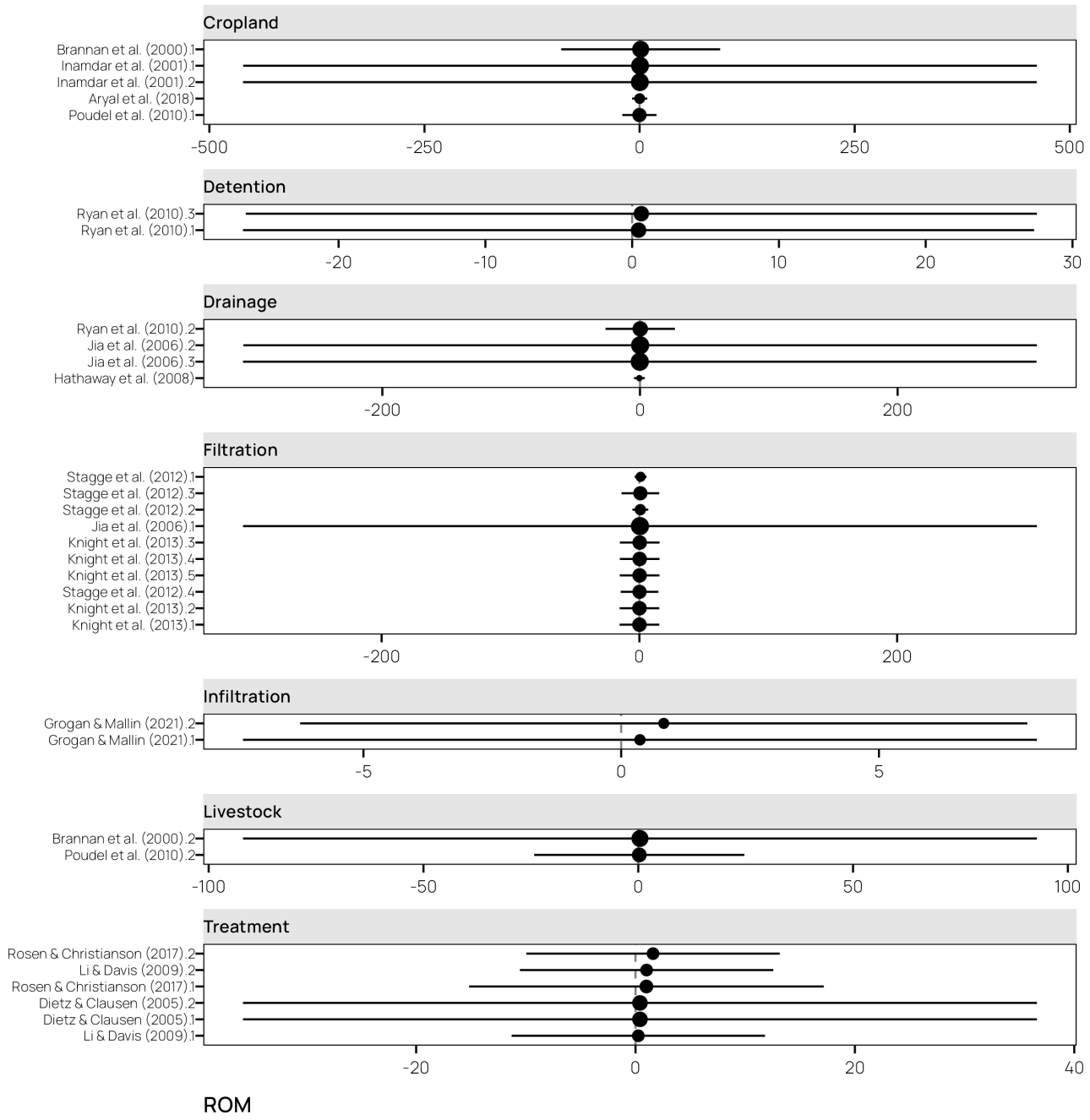

Figure S16. Forest plot of TN effect size estimates and 95% confidence intervals. Size of points are scaled to inverse of the sampling variance.

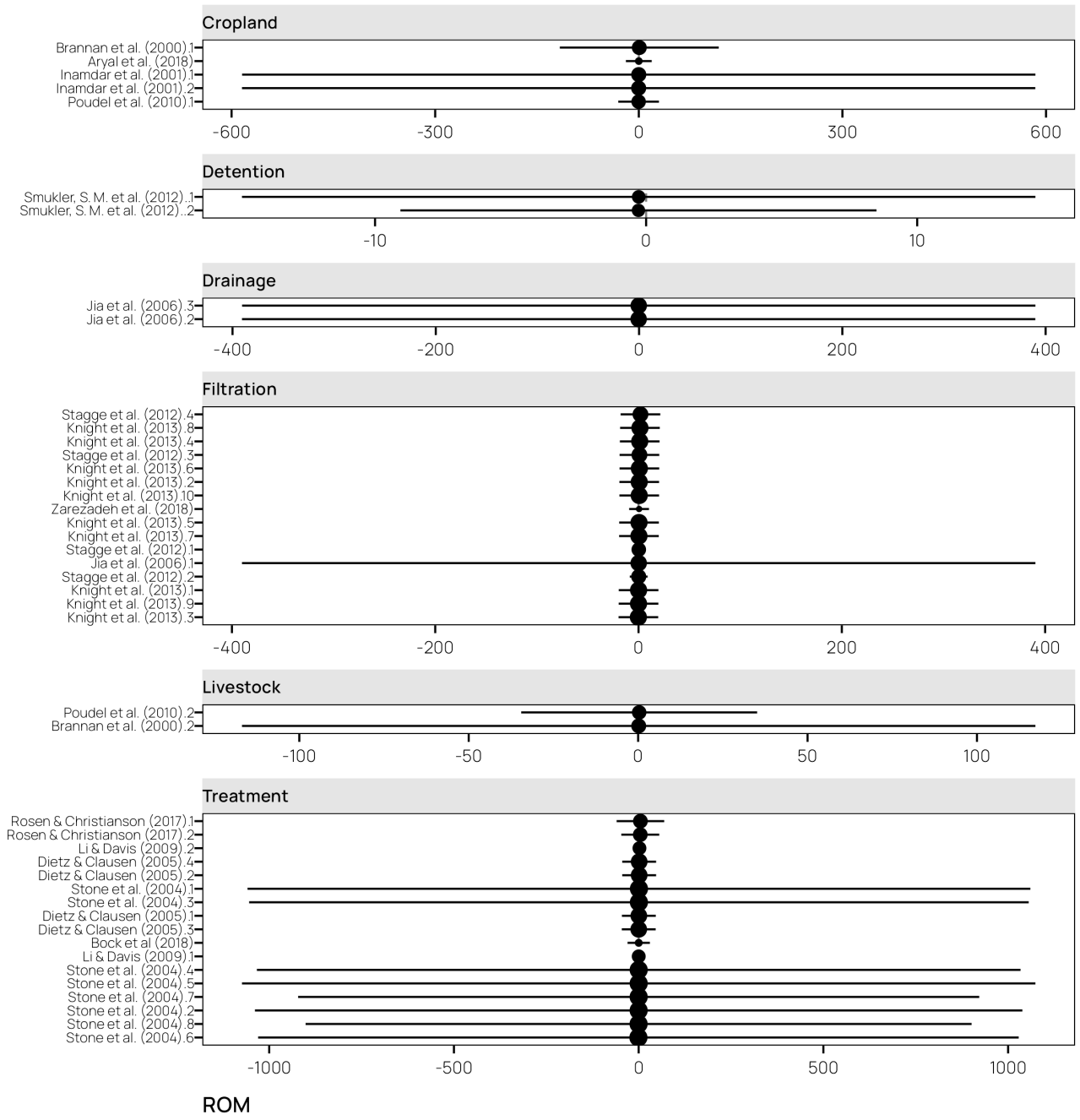

Figure S17. Forest plot of DIN effect size estimates and 95% confidence intervals. Size of points are scaled to inverse of the sampling variance.

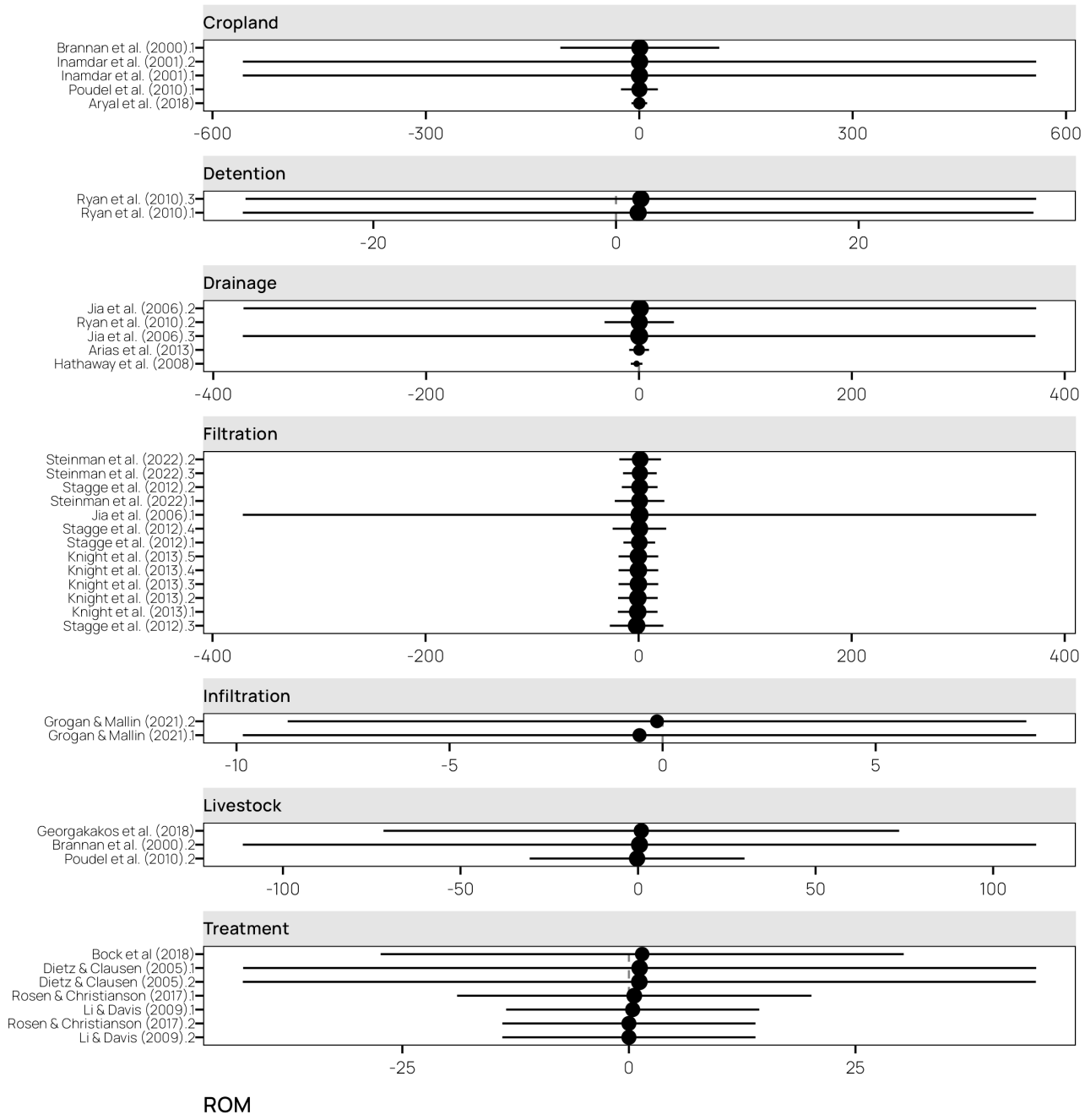

Figure S18. Forest plot of TP effect size estimates and 95% confidence intervals. Size of points are scaled to inverse of the sampling variance.

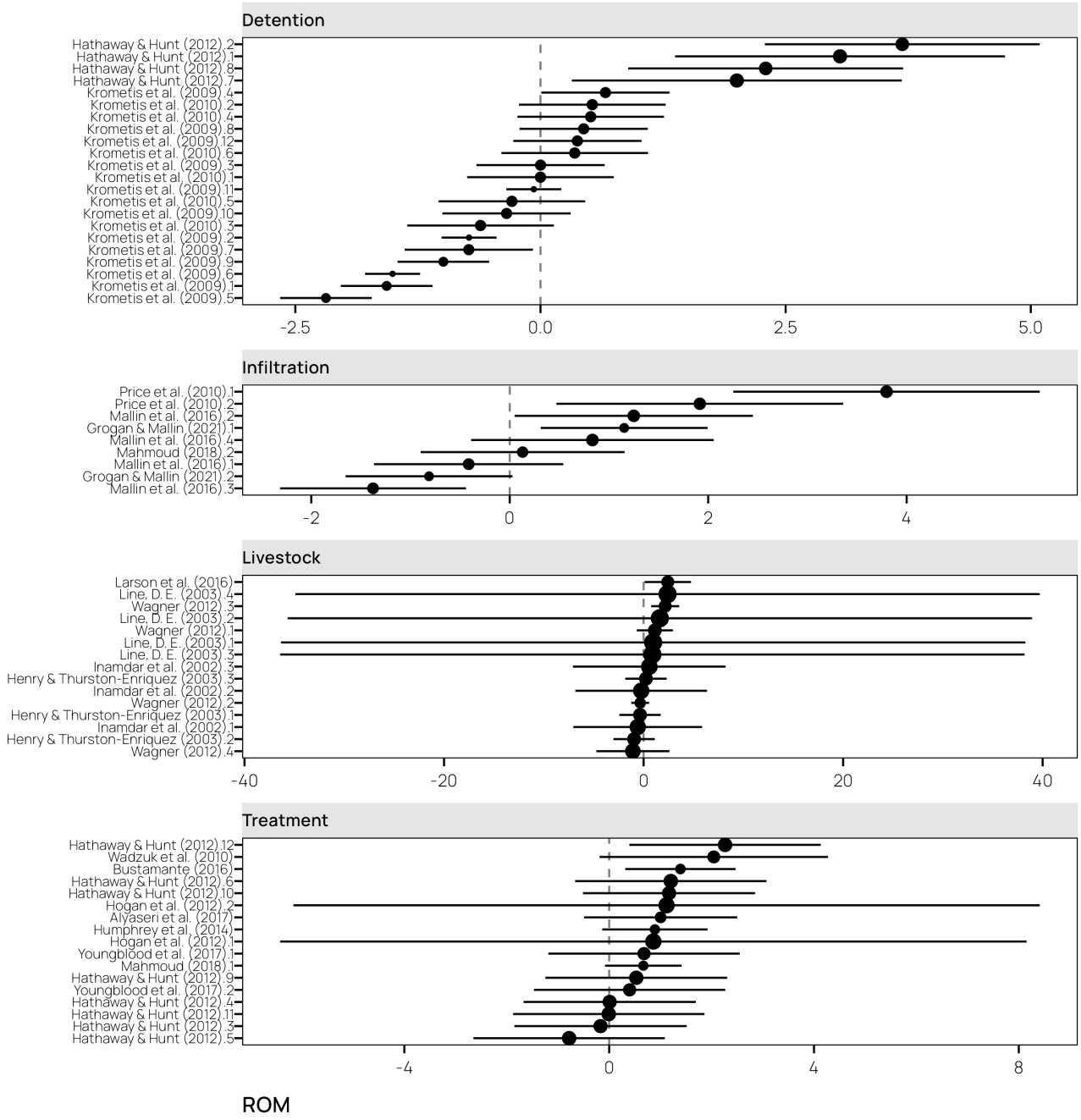

Figure S19. Forest plot of PO_4 effect size estimates and 95% confidence intervals. Size of points are scaled to inverse of the sampling variance.

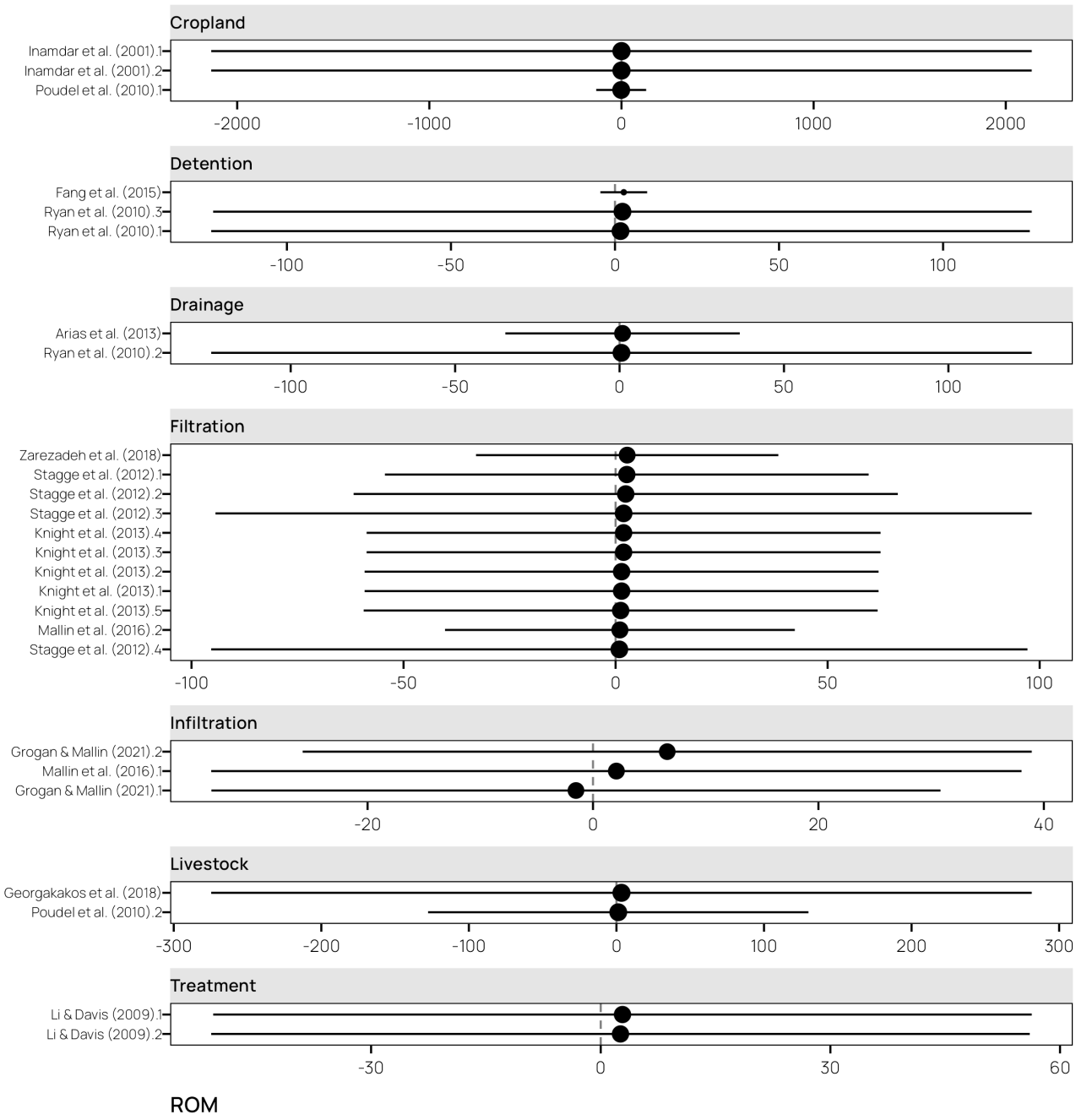

Figure S20. Forest plot of TSS effect size estimates and 95% confidence intervals. Size of points are scaled to inverse of the sampling variance.