Supplementary Figure Captions

Fig. S1. Summary statistics for overall soil variables. Diagonals give kernel density plots of variables in blue. Hedge's *d* are represent mean values of those variables by each unique soil. Off-diagonals give bivariate scatterplots of two variables, and lowess regression lines. Soil organic carbon unit is g kg^{-1}, clay given in percentage by mass, Soil total nitrogen unit is g kg^{-1}, Soil C:N= soil organic carbon/soil total nitrogen.

Fig. S2. Summary statistics for paddy soil variables. Diagonals give kernel density plots of variables in blue. Hedge's *d* are represent mean values of those variables by each unique soil. Off-diagonals give bivariate scatterplots of two variables, and lowess regression lines. Soil organic carbon unit is g kg^{-1}, clay given in percentage by mass, Soil total nitrogen unit is g kg^{-1}, Soil C:N= soil organic carbon/soil total nitrogen.

Fig. S3. Summary statistics for upland soil variables. Diagonals give kernel density plots of variables in blue. Hedge's *d* are represent mean values of those variables by each unique soil. Off-diagonals give bivariate scatterplots of two variables, and lowess regression lines. Soil organic carbon unit is g kg^{-1}, clay given in percentage by mass, Soil total nitrogen unit is g kg^{-1}, Soil C:N= soil organic carbon/soil total nitrogen.

Fig. S4. Summary statistics for overall biochar variables. Diagonals give kernel density plots of variables in blue. Hedge's *d* are represent mean values of those variables by each unique soil. Off-diagonals give bivariate scatterplots of two variables, and lowess regression lines. HTT = pyrolysis temperature, Biochar C = carbon by mass (g kg^{-1}), Biochar N = total nitrogen by mass (g kg^{-1}), Biochar C:N = Biochar C/Biochar N.

Fig. S5. Summary statistics for paddysoil biochar variables. Diagonals give kernel density plots of variables in blue. Hedge's *d* are represent mean values of those variables by each unique soil. Off-diagonals give bivariate scatterplots of two variables, and lowess regression lines. HTT = pyrolysis temperature, Biochar C = carbon by mass (g kg^{-1}), Biochar N = total nitrogen by mass (g kg^{-1}), Biochar C:N = Biochar C/Biochar N.

Fig. S6. Summary statistics for upland biochar variables. Diagonals give kernel density plots of variables in blue. Hedge's *d* are represent mean values of those variables by each unique soil. Off-diagonals give bivariate scatterplots of two variables, and lowess regression lines. HTT = pyrolysis temperature, Biochar C = carbon by mass (g kg^{-1}), Biochar N = total nitrogen by mass (g kg^{-1}), Biochar C:N = Biochar C/Biochar N.

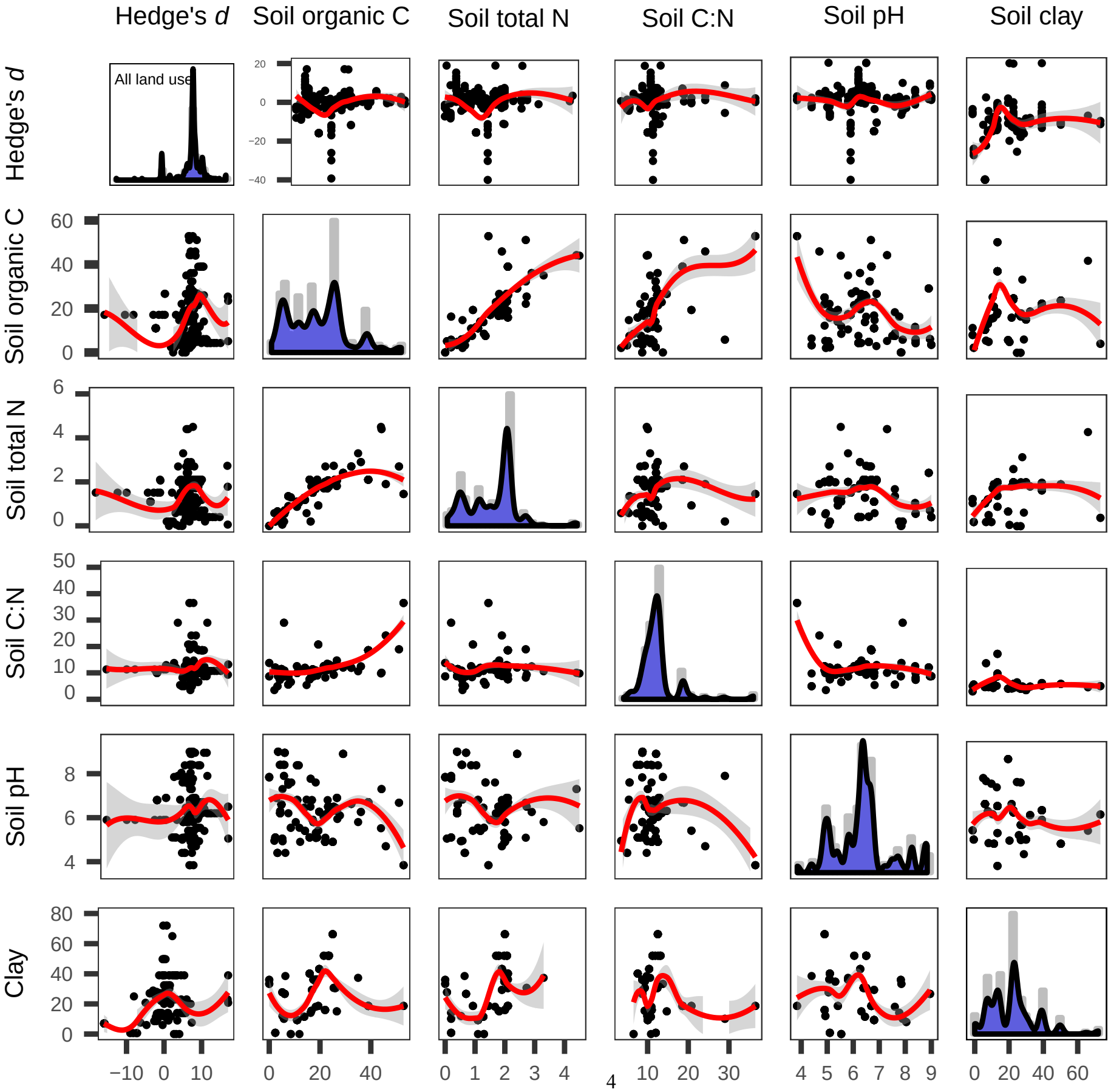
Fig. S7. Summary statistics for overall management variables. Diagonals give kernel density plots of variables in blue. Hedge's *d* are represent mean values of those variables by each unique soil. Off-diagonals give bivariate scatterplots of two variables, and lowess regression lines. Bio.app = biochar application rate (% soil dry mass), Days = experimental duration (day), N app = nitrogen fertilizer application rate (kg N ha^{-1} soil), P_2O_5 app = nitrogen fertilizer application rate (kg P_2O_5 ha^{-1} soil), K_2O app = nitrogen fertilizer application rate (kg K_2O ha^{-1} soil).

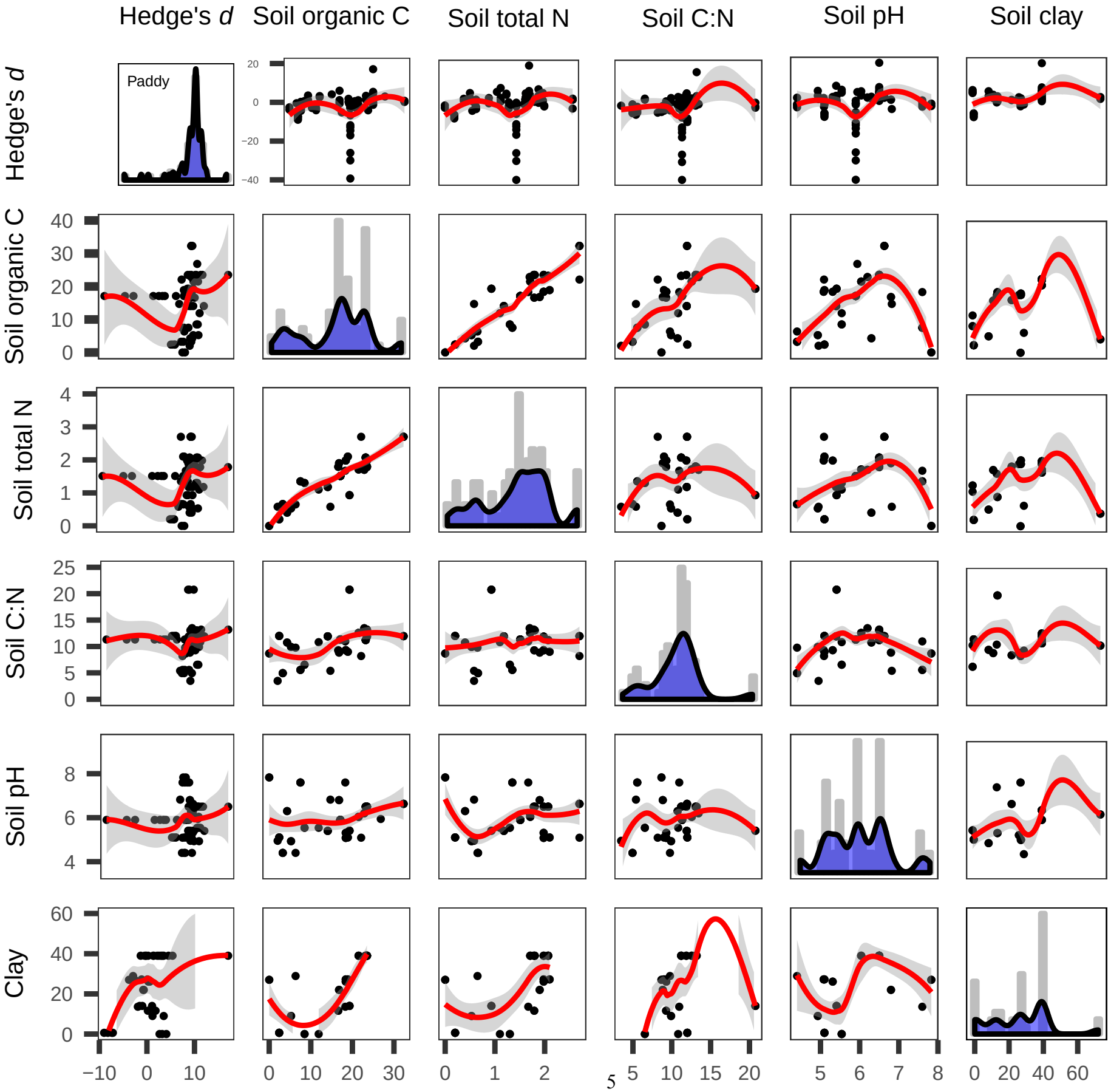
Fig. S8 Summary statistics for paddy soil management variables. Diagonals give kernel density plots of variables in blue. Hedge's *d* are represent mean values of those variables by each unique soil. Off-diagonals give bivariate scatterplots of two variables, and lowess regression lines. Bio.app = biochar application rate (% soil dry mass), Days = experimental duration (day), N app = nitrogen fertilizer application rate (kg N ha^{-1} soil), P_2O_5 app = nitrogen fertilizer application rate (kg P_2O_5 ha^{-1} soil), K_2O app = nitrogen fertilizer application rate (kg K_2O ha^{-1} soil).

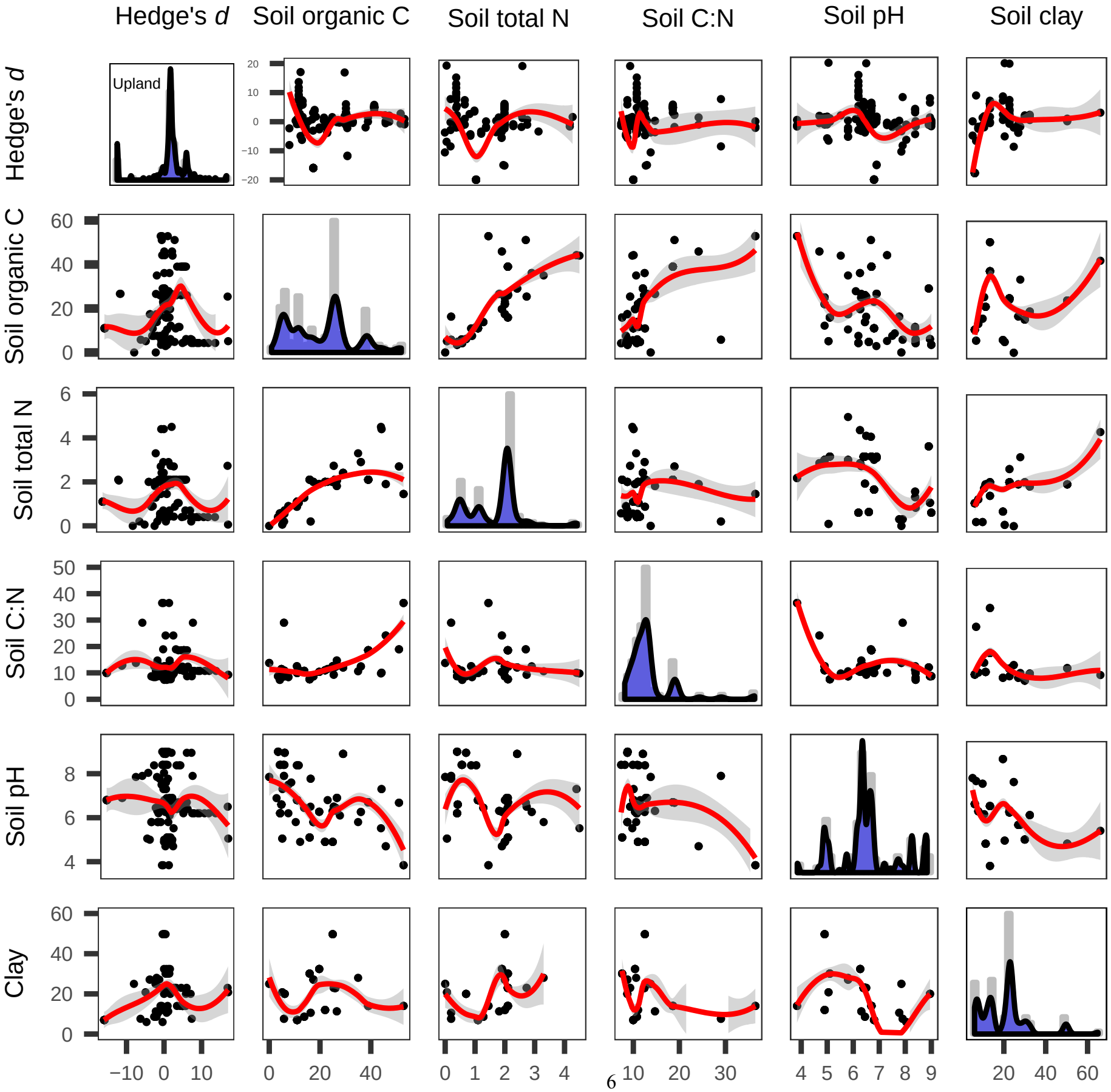
Fig. S9. Summary statistics for upland management variables. Diagonals give kernel density plots of variables in blue. Hedge's *d* are represent mean values of those variables by each unique soil. Off-diagonals give bivariate scatterplots of two variables, and lowess regression lines. Bio.app = biochar application rate (% soil dry mass), Days = experimental duration (day), N app = nitrogen fertilizer application rate (kg N ha^{-1} soil), P_2O_5 app = nitrogen fertilizer application rate (kg P_2O_5 ha^{-1} soil), K_2O app = nitrogen fertilizer application rate (kg K_2O ha^{-1} soil).

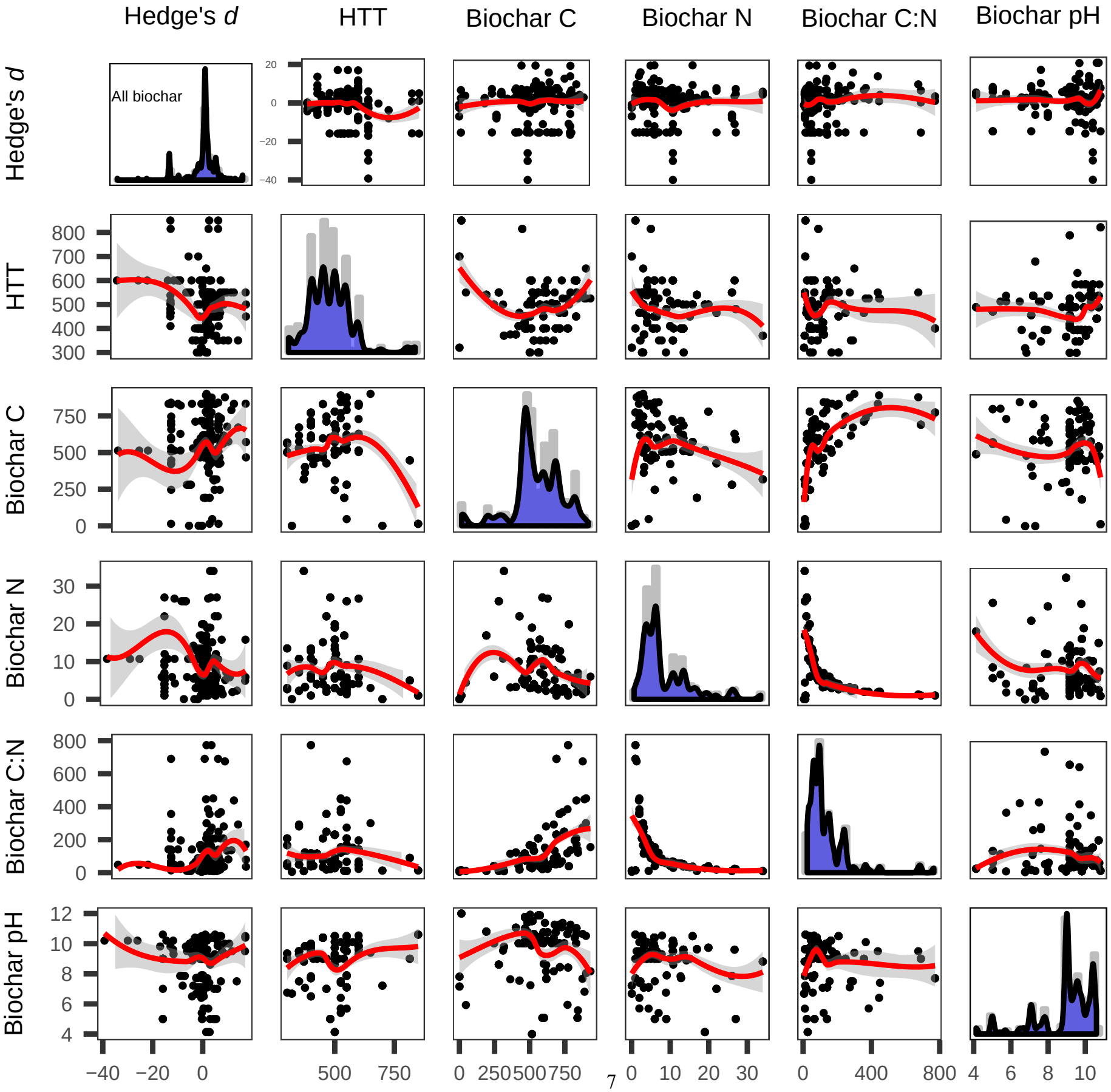
Fig. S10. The relationship between the biochar properties variables and the Hedge's *d* for total soil (a-e), paddy soil (f-j) and upland (k-o). Shaded bands indicate 95 % confidence intervals for the mean effect of each treatment. Negative *d* values indicate increased atmospheric CH_4 sink or decreased CH_4 emission by soils with biochar addition. The dotted vertical line indicates Hedge's *d* of 0 or no change in methane flux upon biochar addition.

Fig. S11. The relationship between the management factors variables and the Hedge's *d* for total soil (a-e), paddy soil (f-j) and upland (k-o). Shaded bands indicate 95 % CI for the mean effect of each treatment. Negative *d* values indicate increased atmospheric CH_4 sink or decreased CH_4 emission by soils with biochar addition. The dotted vertical line indicates Hedge's *d* of 0 or no change in methane flux upon biochar addition.


Hedge's d
Soil organic C
Soil total N
Soil C:N
Soil pH
Soil clay
Clay
All land use


Hedge's d
Soil organic C
Soil total N
Soil C:N
Soil pH
Soil clay
Clay
Paddy


Hedge's d
Soil organic C
Soil total N
Soil C:N
Soil pH
Soil clay
Clay
Upland


Hedge's d
HTT
Biochar C
Biochar N
Biochar C:N
Biochar pH
All biochar
20
0
−20
−40
800
700
600
500
400
300
750
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250
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30
20
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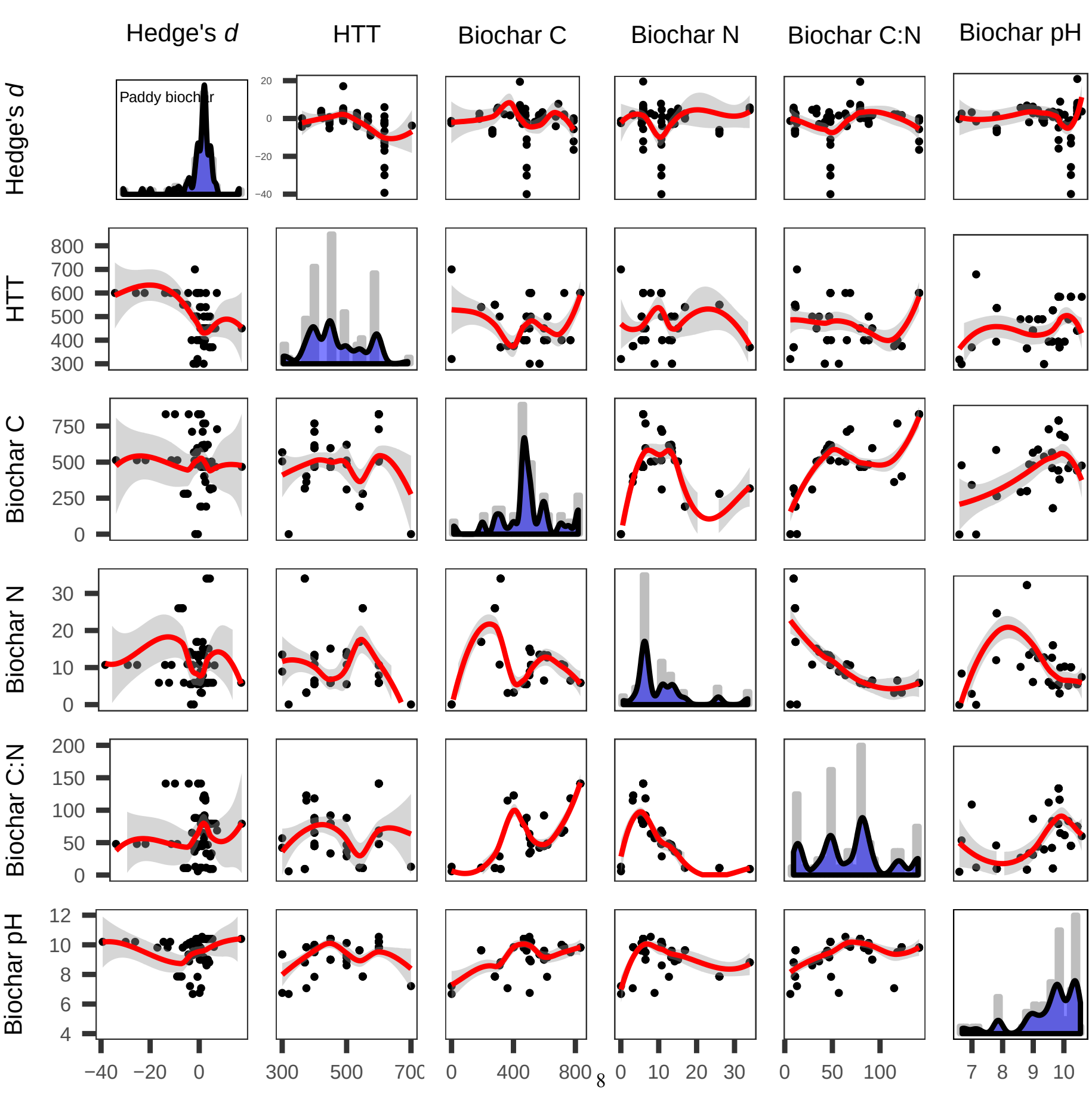
0 400 800
4 6 8 10


Hedge's d
HTT
Biochar C
Biochar N
Biochar C:N
Biochar pH
Paddy biochar
20
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800
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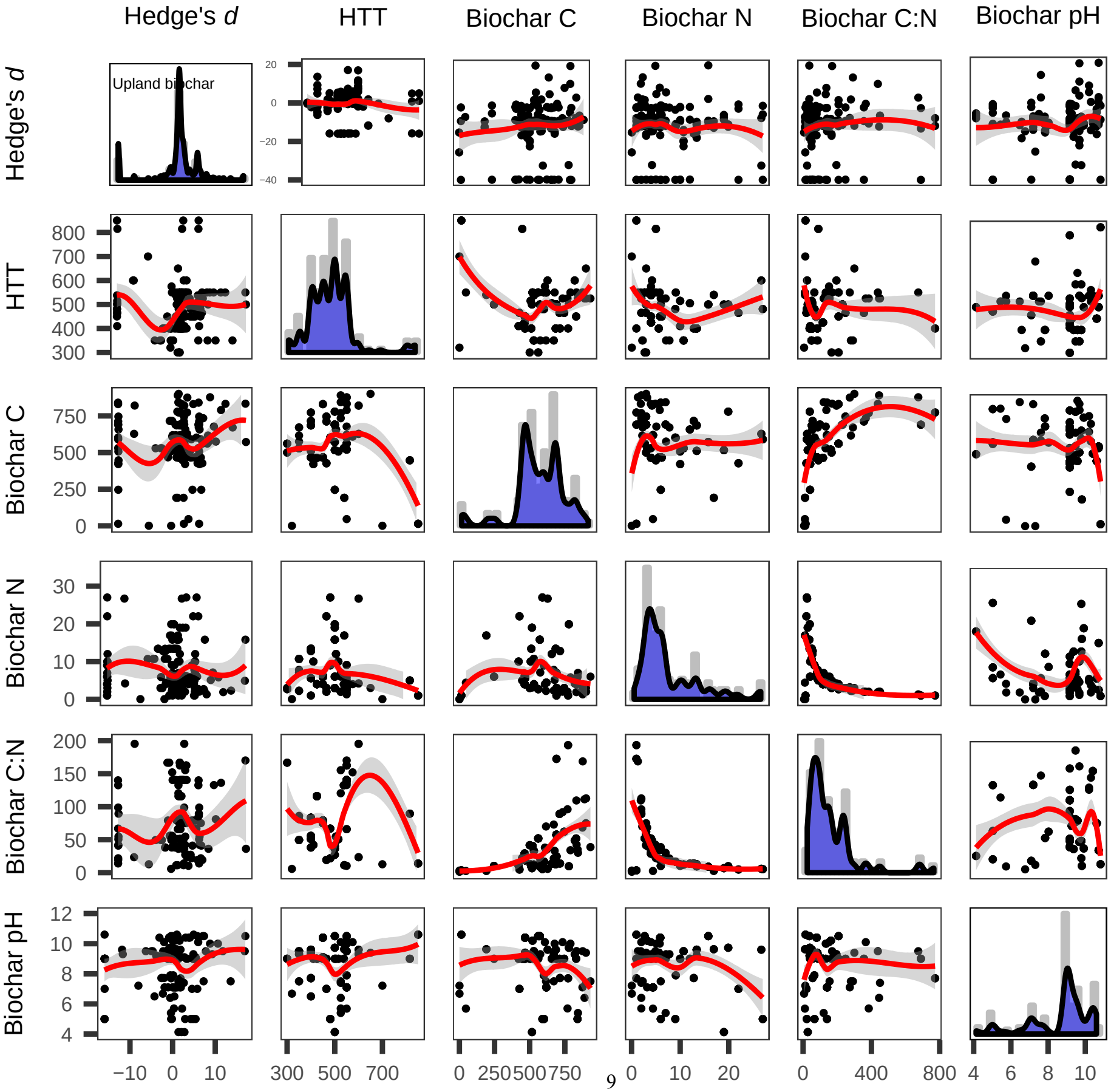
Hedge's d
HTT
Biochar C
Biochar N
Biochar C:N
Biochar pH
Upland biochar
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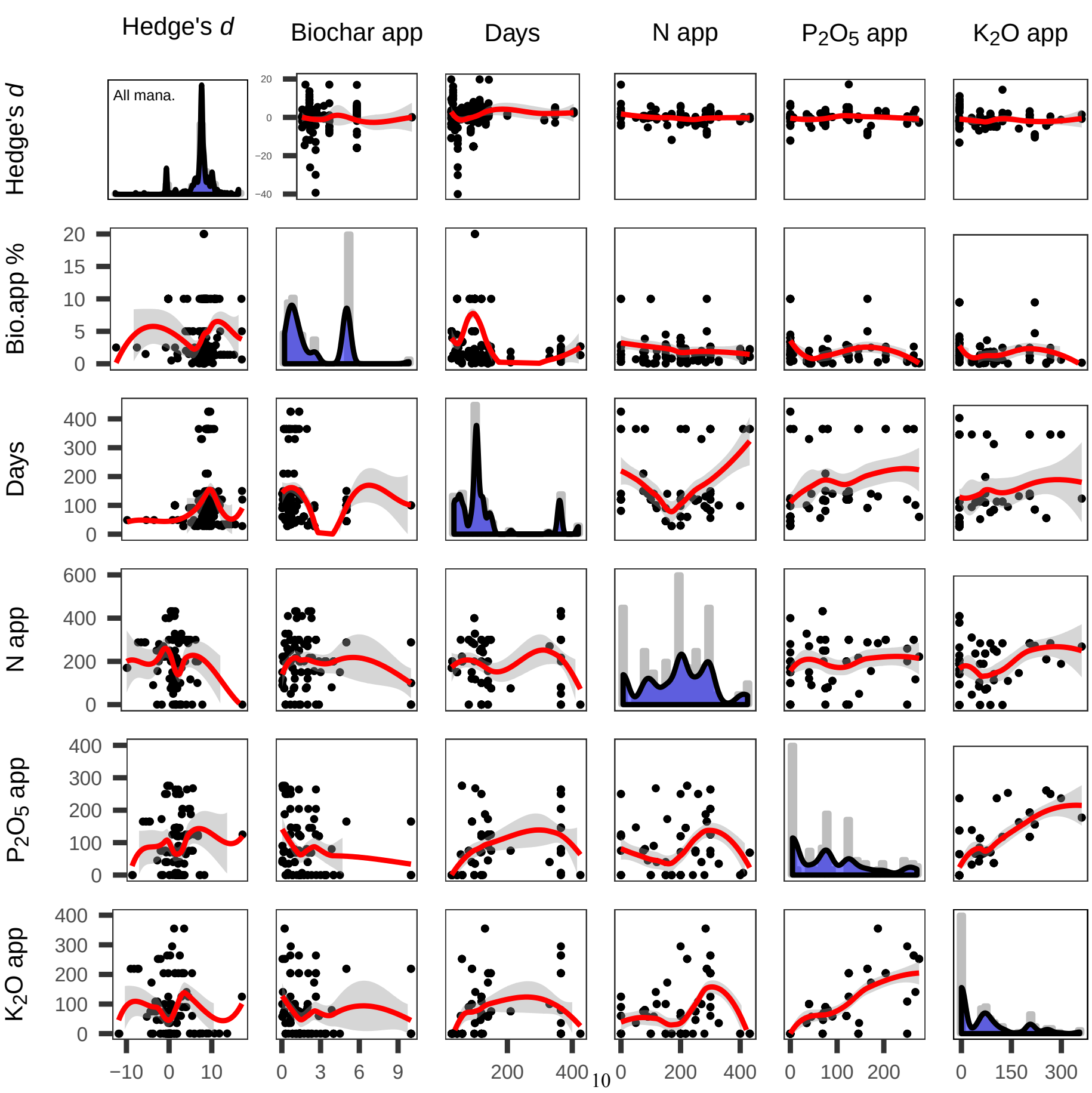
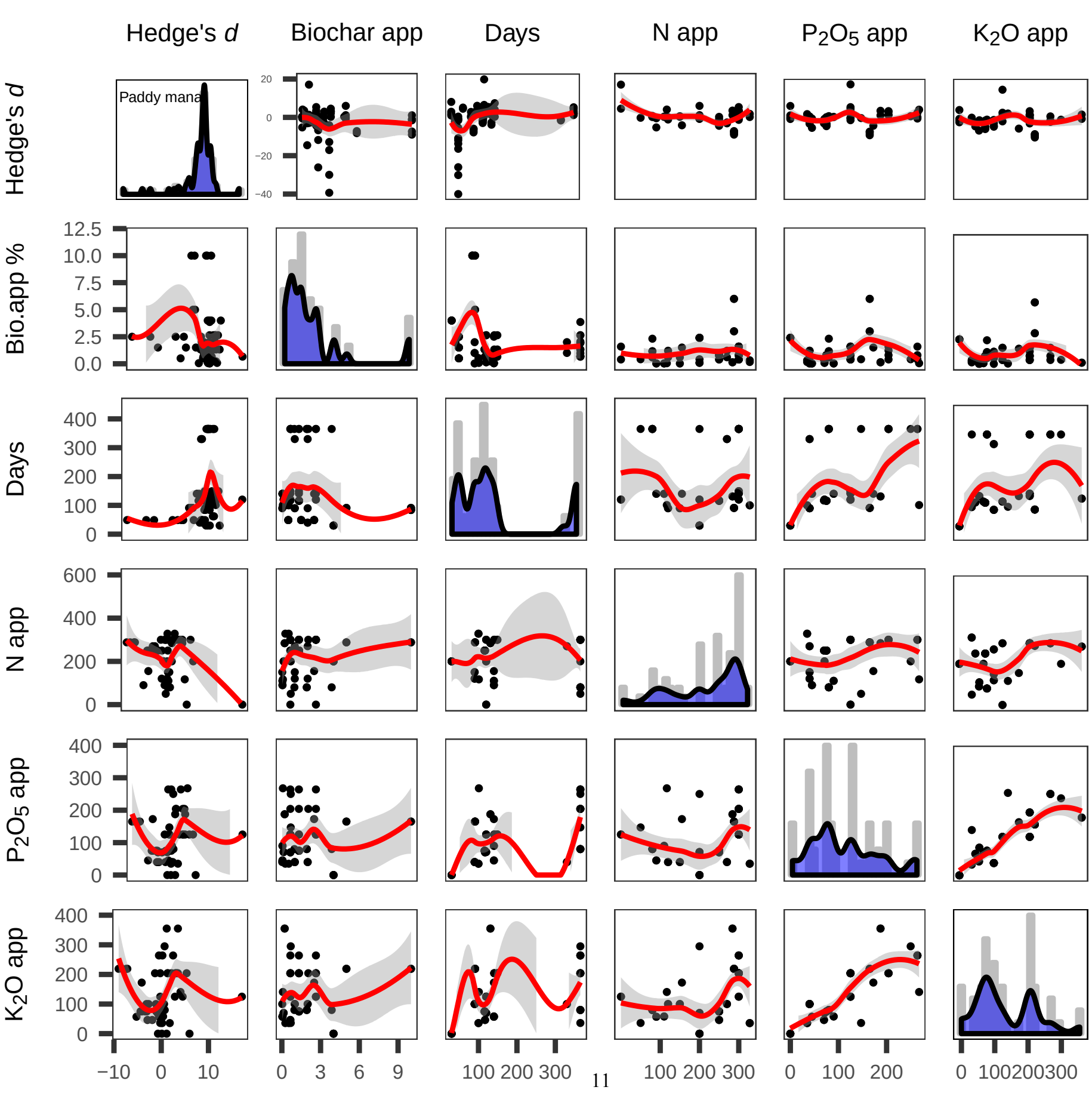

Hedge's d
Biochar app
Days
N app
P2O5 app
K2O app
Hedge's d
Bio.app %
Days
N app
P2O5 app
K2O app
All mana.


Hedge's d
Biochar app
Days
N app
P2O5 app
K2O app
Hedge's d
Bio.app %
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P2O5 app
K2O app
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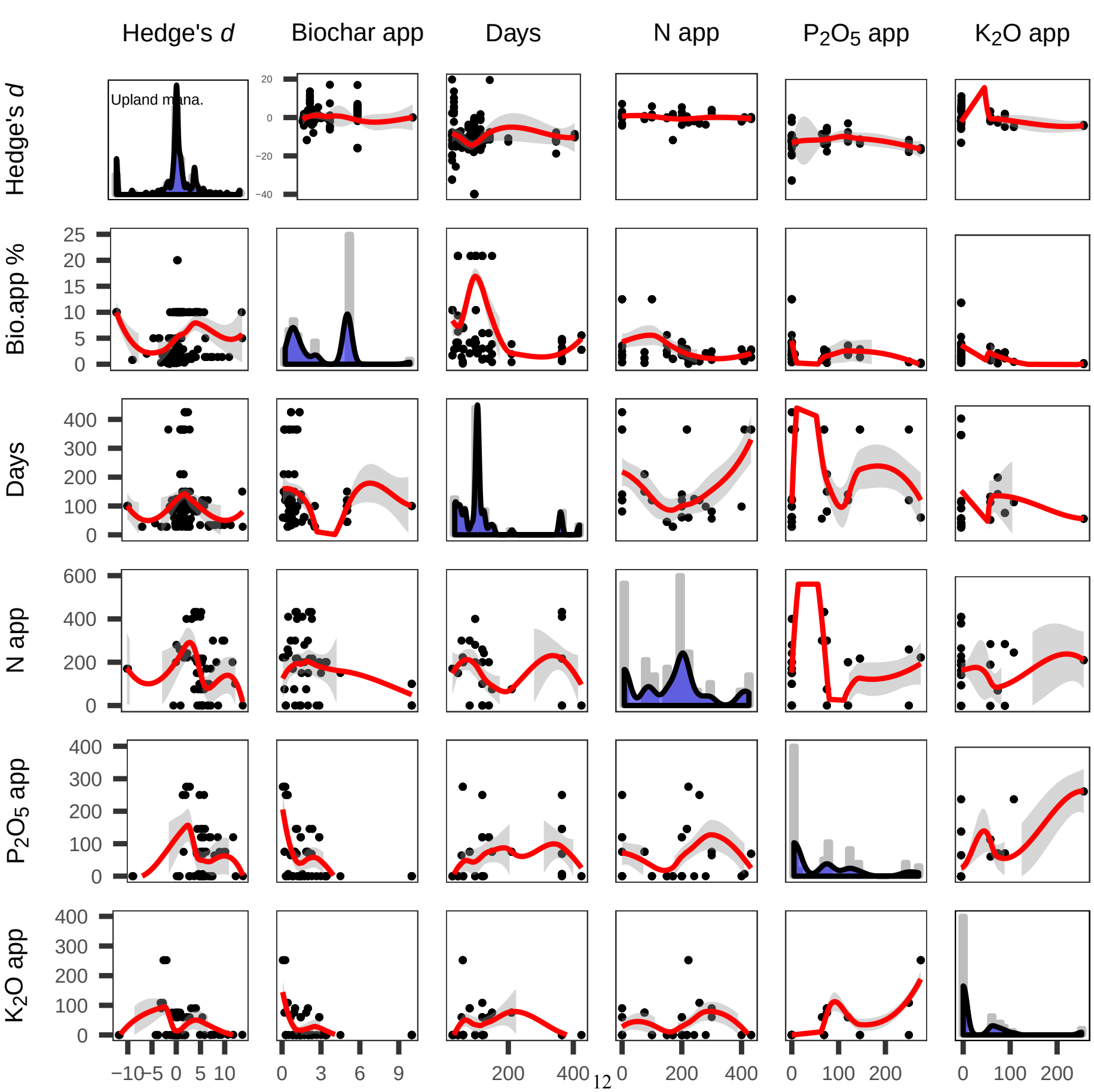
Hedge's d
Biochar app
Days
N app
P2O5 app
K2O app
Hedge's d
Bio.app %
Days
N app
P2O5 app
K2O app
Upland mana.
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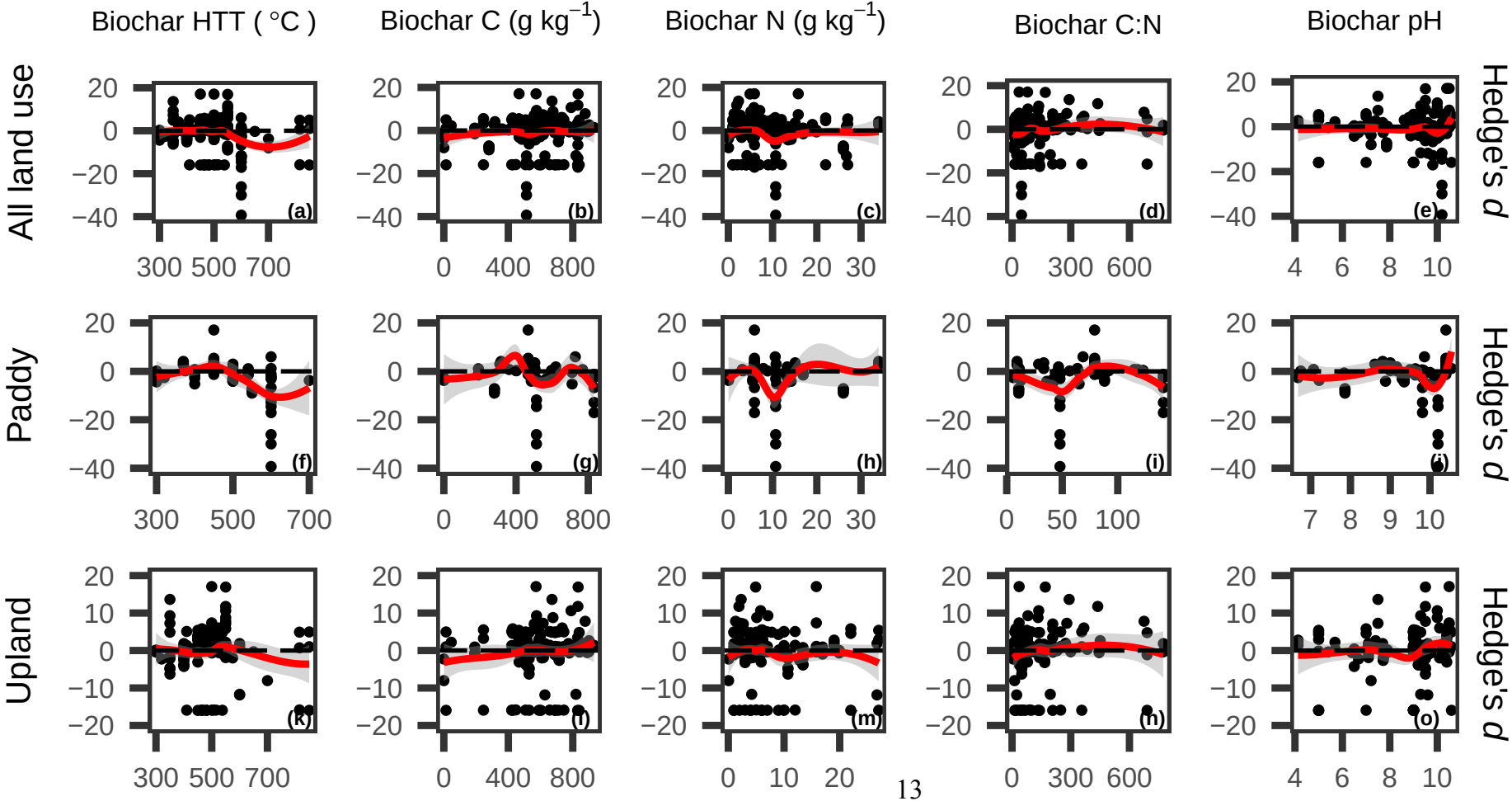
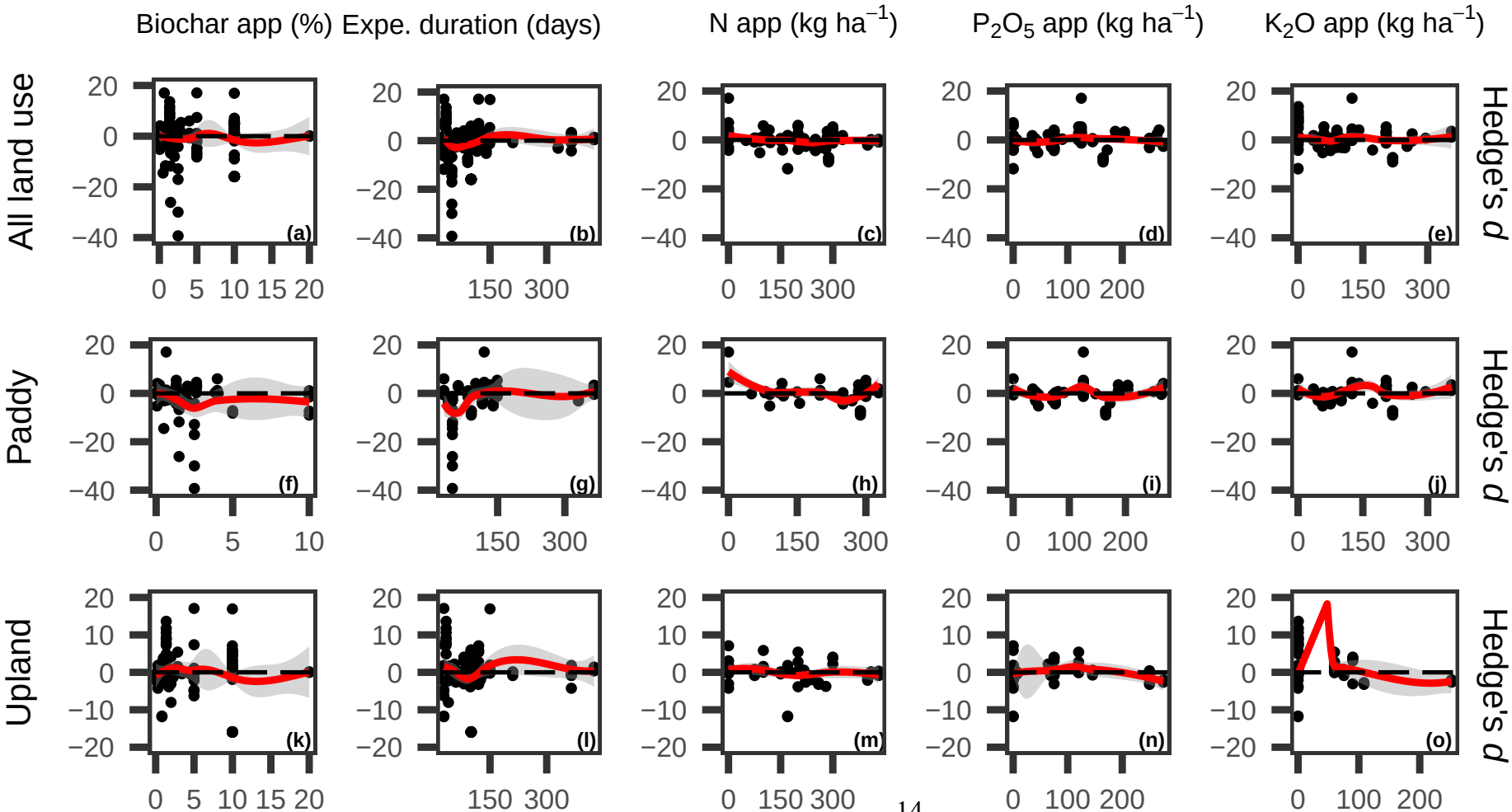

Biochar HTT (°C)
Biochar C (g kg^{-1})
Biochar N (g kg^{-1})
Biochar C:N
Biochar pH
All land use
Paddy
Upland
Hedge's d
(a)
(b)
(c)
(d)
(e)
(f)
(g)
(h)
(i)
(j)
(k)
(l)
(m)
(n)
(o)


Biochar app (%)
Expe. duration (days)
N app (kg ha^{-1})
P_2O_5 app (kg ha^{-1})
K_2O app (kg ha^{-1})
All land use
Paddy
Upland
Hedge's d
(a)
(b)
(c)
(d)
(e)
(f)
(g)
(h)
(i)
(j)
(k)
(l)
(m)
(n)
(o)