Supplemental Fig. 1. Confidence intervals (95%) for three experimental treatments where n=4. Plot A shows the confidence intervals (CI) as vertical lines with the mean value at the horizontal central line. Plot B has the same CI as plot A, however, ‘cat’s eyes’ have been added to the intervals to help illustrate the plausibility of the true mean for each treatment. The most plausible areas are at the ‘fattest’ part of the cat’s eye, for example, in treatment 3 the most plausible area is between approximately 7.5 and 9. Cumming (2014) suggested that when we see CI as in plot A, it can be helpful to visualize a ‘cat’s eye’ “which is a beautiful picture of the uncertainty of our data.” Cumming G. 2014, Observer, March, No. 3. There’s life beyond .05.
Supplemental Figure 2. Soil organic carbon (SOC) in the top 30 cm of soil for three systems prior to planting cover crops during Years 4 and 8 in the Salinas Organic Cropping Systems trial at Salinas, CA. This figure was modified from Figure 3A in the paper. Blue lines were added to illustrate the change in SOC at Year 8 from System 1 to 2 within each of the four replicates (#1 to 4) and red lines show the change from System 2 to 3. In all replicates there was an increase in SOC from System 1 to 2 to 3, except with replicate #2 where there was slight decline from System 2 to 3. See Figure 3 in the paper for more details on the three systems.
Supplemental Fig. 3. (A) Soil organic carbon (SOC) in the top 30 cm of soil for three systems prior to planting cover crops during Years 4 and 8 and (B) the difference between years in the Salinas Organic Cropping Systems trial at Salinas, CA. By seed weight the legume–rye cover crop included 90% legumes and 10% rye. Systems are in order (from left to right) of increasing organic matter inputs: System 1- Winter fallow (“Fal”) for Years 1 to 3, and 5 to 7, cover cropped during Years 4 and 8, without compost (“NoCp”); System 2- Same as System 1 but received annual compost additions; System 3- Cover cropped annually with annual compost additions. Raw data points are shown as clusters of circles, squares or triangles and are in order of replicates 1 to 4 for each data cluster; the vertical bar within each data cluster is the 95% confidence interval (CI) with the mean at the central horizontal line on the bar. Means and CI in brackets [ ] of SOC for Systems 1, 2, and 3 were 6.3 [5.1, 7.5], 8.4 [7.4, 9.3], and 8.3 [6.1, 10.4] for Year 4, and 4.9 [2.9, 6.9], 7.2 [4.2, 10.2], 9.3 [5.9, 12.7] for Year 8. Mean and CI of SOC differences between years were −1.4 [−4.0, 1.3], −1.2 [−4.3, 2.0], and 1.0 [−3.4, 5.5] for Systems 1, 2, and 3, respectively. The “rule of eye method” (Cumming and Finch, 2005; Cumming et al., 2007) described in the Statistical Analysis section can be used to compare the overlap between CI whereby the smaller the overlap between CI, the stronger the evidence of a true difference.
Supplemental Fig. 4. (A) Soil nitrate concentrations in the top 30 cm of soil in three systems prior to planting cover crops during Years 4 and 8, and (B) the difference between years in the Salinas Organic Cropping Systems trial at Salinas, CA. By seed weight the legume-rye cover crop included 90% legumes and 10% rye. Systems are in order (from left to right) of increasing organic matter inputs: System 1 - Winter fallow (‘Fal’) for years 1 to 3, and 5 to 7, cover cropped during years 4 and 8, without compost (‘NoCp’); System 2 - Same as System 1 but received annual compost additions; System 3 - Cover cropped annually with annual compost additions. Raw data points are shown as clusters of circles, squares or triangles and are in order of replicates 1 to 4 for each data cluster. The vertical bar within each data cluster is the 95% confidence interval (CI) with the mean at the central horizontal line on the bar. Means and CI in [ ] of soil nitrate for Systems 1, 2 and 3, were 7.3 [0.8, 13.8], 6.9 [4.0, 9.7] and 10.0 [8.8, 11.2] for Year 4, and 5.9 [3.2, 8.7], 7.5 [4.9, 10.1], 21.6 [19.6, 23.5] for Year 8. Mean and CI of soil nitrate differences between years were -1.4 [-9.9, 7.2], 0.6 [-1.7, 3.0], and 11.6 [8.9, 14.2] for System 1, 2, and 3, respectively. The ‘rule of eye method’ (Cumming and Finch, 2005; Cumming et al., 2007) described in the Statistical Analysis section can be used to compare the overlap between CI whereby the smaller the overlap between confidence intervals, the stronger the evidence of a true difference.

**ANOVA P-values**

<table>
<thead>
<tr>
<th>Year</th>
<th>Syst. 1 vs 2</th>
<th>Syst. 1 vs 3</th>
<th>Syst. 2 vs 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 4</td>
<td>0.79</td>
<td>0.11</td>
<td>0.07</td>
</tr>
<tr>
<td>Year 8</td>
<td>0.33</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

Unadj. P. indicate the unadjusted comparison-wise error rates
Adj. P – Bonferroni adjusted P-values to control the family-wise error rate; adjusted P values are 6 times larger than unadjusted P values because six comparisons are made.

P-values ≤0.15 are highlighted in blue.
Supplemental Fig. 5. (A,B,C) Total, rye, and legume cover crop densities for three systems during Years 4 and 8, and (D,E,F) the difference between harvests in the Salinas Organic Cropping Systems trial at Salinas, CA. By seed weight the legume-rye cover crop included 90% legumes and 10% rye. Systems are in order (from left to right) of increasing organic matter inputs: System 1 - Winter fallow ('Fal') for years 1 to 3, and 5 to 7, cover cropped during years 4 and 8, without compost ('NoCp'); System 2 - Same as System 1 but received annual compost additions; System 3 - Cover cropped annually with annual compost additions. Raw data points are shown as clusters of circles, squares or triangles and are in order of replicates 1 to 4 for each data cluster. The vertical bar within each data cluster is the 95% confidence interval (CI) with the mean at the central horizontal line on the bar. For Systems 1, 2 and 3, mean total densities and 95% CI in [ ] were 329 [248, 410], 317 [224, 410], 335 [202, 467] for Year 4, and 308 [240, 364], 322 [280, 364], and 313 [291, 335] for Year 8. The 'rule of eye method' (Cumming and Finch, 2005; Cumming et al., 2007) described in the Statistical Analysis section can be used to compare the overlap between CI whereby the smaller the overlap between CI, the stronger the evidence of a true difference. P-values ≤0.15 are highlighted in blue.
Supplemental Fig. 6. Total, rye, and legume above ground cover crop biomass across three systems during January and March harvests in Years 4 and 8 and the difference between years in the Salinas Organic Cropping Systems trial at Salinas, CA. By seed weight the legume-rye cover crop included 90% legumes and 10% rye. Systems are in order (from left to right) of increasing organic matter inputs: System 1 - Winter fallow ('Fal') for years 1 to 3, and 5 to 7, cover cropped during years 4 and 8, without compost ('NoCp'); System 2 - Same as System 1 but received annual compost additions; System 3 - Cover cropped annually with annual compost additions. Raw data points are shown as clusters of circles, squares or triangles and are in order of replicates 1 to 4 for each data cluster. The vertical bar within each data cluster is the 95% confidence interval with the mean at the central horizontal line on the bar. Differences (i.e. effect sizes) of total, rye, and legume biomass within year and from January to March are in panels D-F. The ‘rule of eye method’ (Cumming and Finch, 2005; Cumming et al., 2007) described in the Statistical Analysis section can be used to compare the overlap between CIs whereby the smaller the overlap between confidence intervals, the stronger the evidence of a true difference. 

P-values ≤0.15 are highlighted in blue.
Supplemental Fig. 7. (A) Percentage of legume biomass of total cover crop biomass for three systems during January and March of Years 4 and 8, and (B) the difference between harvests in the Salinas Organic Cropping Systems trial at Salinas, CA. By seed weight the legume-rye cover crop included 90% legumes and 10% rye. Systems are in order (from left to right) of increasing organic matter inputs: System 1 - Winter fallow (‘Fal’) for years 1 to 3, and 5 to 7, cover cropped during years 4 and 8, without compost (‘NoCp’); System 2 - Same as System 1 but received annual compost additions; System 3 - Cover cropped annually with annual compost additions. Raw data points are shown as clusters of circles, squares or triangles and are in order of replicates 1 to 4 for each data cluster. The vertical bar within each data cluster is the 95% confidence intervals (CI) with the mean at the central horizontal line on the bar. Differences (i.e., effect sizes) in the percentage of legume biomass from January to March within year are in panel B. The ‘rule of eye method’ (Cumming and Finch, 2005; Cumming et al., 2007) described in the Statistical Analysis section can be used to compare the overlap between CI whereby the smaller the overlap between confidence intervals, the stronger the evidence of a true difference.

ANOVA

| January  | Year 0.40 | Syst. 0.47 | YxS 0.59 |
| March    | Year 0.02 | Syst. 0.24 | YxS 0.31 |

P-values ≤0.15 are highlighted in blue.

Percentage of Legume Biomass

| Year | % Legume Comparison | ---January--- |  | ---March--- |
|------|---------------------|---------------|---------------|
| Year 4 | Syst. 1 vs 2 | 0.47 | 1.00 | 0.32 | 1.00 |
| Year 4 | Syst. 1 vs 3 | 0.18 | 1.00 | 0.26 | 1.00 |
| Year 4 | Syst. 2 vs 3 | 0.50 | 1.00 | 0.87 | 1.00 |
| Year 8 | Syst. 1 vs 2 | 0.57 | 1.00 | 0.33 | 1.00 |
| Year 8 | Syst. 1 vs 3 | 0.84 | 1.00 | 0.29 | 1.00 |
| Year 8 | Syst. 2 vs 3 | 0.45 | 1.00 | 0.06 | 0.36 |

Unadj. P. indicate the unadjusted comparison-wise error rates
Adj. P – Bonferroni adjusted P-values to control the family-wise error rate; adjusted P values are 6 times larger than unadjusted P values because six comparisons are made.
Supplemental Fig. 8. (A,B,C) Total, rye, and legume shoot nitrogen accumulation for three systems during January and March harvests in Years 4 and 8, and (D,E,F) the difference between harvests in the Salinas Organic Cropping Systems trial at Salinas, CA. By seed weight the legume-rye cover crop included 90% legumes and 10% rye. Systems are in order (from left to right) of increasing organic matter inputs: System 1 - Winter fallow ('Fal') for years 1 to 3, and 5 to 7, cover cropped during years 4 and 8, without compost ('NoCp'); System 2 - Same as System 1 but received annual compost additions; System 3 - Cover cropped annually with annual compost additions. Raw data points are shown as circles, squares or triangles clusters and are in order of replicates 1 to 4 for each data cluster. The vertical bar within each data cluster is the 95% confidence interval with the mean at the central horizontal line on the bar. Differences (i.e. effect sizes) of total, rye, and legume biomass within year and from January to March are in panels D-F. Note that the scale of the y-axes are different between biomass types. The ‘rule of eye method’ (Cumming and Finch, 2005; Cumming et al., 2007) described in the Statistical Analysis section can be used to compare the overlap between confidence intervals whereby the smaller the overlap between confidence intervals, the stronger the evidence of a true difference.

**ANOVA P-values**

**March**
- Year 0.25
- Syst. 0.16
- YxS 0.40

**January**
- Year <0.01
- Syst. 0.16
- YxS 0.31

**ANOVA P-values**

**March**
- Year 0.24
- Syst. 0.03
- YxS 0.59

**January**
- Year 0.04
- Syst. <0.01
- YxS 0.76

**ANOVA P-values**

**March**
- Year 0.98
- Syst. 0.34
- YxS 0.34

**January**
- Year 0.84
- Syst. 0.93
- YxS 0.48

**Cover Crop Nitrogen Accumulation**

- P-values ≤0.15 are highlighted in blue.

- Year 4 Syst. 1 vs 2 0.94 1.00 0.40 1.00
- Year 4 Syst. 1 vs 3 0.36 1.00 0.03 0.20
- Year 4 Syst. 2 vs 3 0.33 1.00 0.14 0.83
- Year 8 Syst. 1 vs 2 0.10 0.63 0.49 1.00
- Year 8 Syst. 1 vs 3 0.03 0.18 0.51 1.00
- Year 8 Syst. 2 vs 3 0.46 1.00 0.97 1.00

- Year 4 Syst. 1 vs 2 0.60 1.00 0.12 0.74
- Year 4 Syst. 1 vs 3 0.09 0.54 0.01 0.07
- Year 4 Syst. 2 vs 3 0.21 1.00 0.18 1.00
- Year 8 Syst. 1 vs 2 0.19 1.00 0.75 1.00
- Year 8 Syst. 1 vs 3 0.02 0.11 0.51 1.00
- Year 8 Syst. 2 vs 3 0.19 1.00 0.14 0.86
- Year 4 & 8 Syst. 1 vs 2 0.21 0.64 0.20 0.61
- Year 4 & 8 Syst. 1 vs 3 0.02 0.05 0.01 0.03
- Year 4 & 8 Syst. 2 vs 3 0.10 0.29 0.07 0.22

See footnote in table above describing Unadj. P and Adj. P.
Supplemental Figure 9. (A,B,C) Cover crop shoot nitrogen concentration of total, rye, and legume cover crop shoot biomass for three systems during January and March harvests in Years 4 and 8, and (D,E,F) the difference between harvests in the Salinas Organic Cropping Systems trial at Salinas, CA. By seed weight the legume-rye cover crop included 90% and 10% rye. Systems are in order (from left to right) of increasing organic matter inputs: System 1 - Winter fallow (‘Fal’) for years 1 to 3, and 5 to 7, cover cropped during years 4 and 8, without compost (‘NoCp’); System 2 - Same as System 1 but received annual compost additions; System 3 - Cover cropped annually with annual compost additions. Raw data points are shown as circles, squares or triangles clusters and are in order of replicates 1 to 4 for each data cluster. The vertical bar within each data cluster is the 95% confidence interval with the mean at the central horizontal line on the bar. Differences (i.e. effect sizes) of total, rye, and legume biomass within year and from January to March are in panels D-F. Note that the scale of the y-axes are different between biomass types. The ‘rule of eye method’ (Cumming and Finch, 2005; Cumming et al., 2007) described in the Statistical Analysis section can be used to compare the overlap between confidence intervals whereby the smaller the overlap between confidence intervals, the stronger the evidence of a true difference.

P-values ≤0.15 are highlighted in blue.

ANOVA

**January**
- Year: 0.01
- Syst: 0.17
- YxS: 0.14

**March**
- Year: <0.01
- Syst: 0.06
- YxS: 0.15

ANOVA

**January**
- Year: 0.003
- Syst: 0.091
- YxS: 0.34

**March**
- Year: <0.01
- Syst: <0.01
- YxS: 0.01

ANOVA

**January**
- Year: 0.14
- Syst: 0.76
- YxS: 0.19

**March**
- Year: <0.01
- Syst: 0.12
- YxS: 0.45

---January---

---|---|---|---|---
Year 4 Syst. 1 vs 2 | 0.77 | 1.00 | 0.95 | 1.00
Year 4 Syst. 1 vs 3 | 0.96 | 1.00 | 0.22 | 1.00
Year 4 Syst. 2 vs 3 | 0.73 | 1.00 | 0.25 | 1.00
Year 8 Syst. 1 vs 2 | 0.28 | 1.00 | 0.46 | 1.00
Year 8 Syst. 1 vs 3 | 0.01 | 0.06 | 0.01 | 0.04
Year 8 Syst. 2 vs 3 | 0.10 | 0.60 | 0.02 | 0.13

Unadj. P. indicate the unadjusted comparison-wise error rates.

Adj. P – Bonferroni adjusted P-values to control the family-wise error rate; adjusted P values are 6 times larger than unadjusted P values because six comparisons are made.

---March---

---|---|---|---|---
Year 4 Syst. 1 vs 2 | 0.61 | 1.00 | 0.11 | 0.67
Year 4 Syst. 1 vs 3 | 0.43 | 1.00 | 0.01 | 0.08
Year 4 Syst. 2 vs 3 | 0.77 | 1.00 | 0.23 | 1.00
Year 8 Syst. 1 vs 2 | 0.17 | 1.00 | 0.16 | 0.97
Year 8 Syst. 1 vs 3 | 0.01 | 0.09 | <0.01 | <0.01
Year 8 Syst. 2 vs 3 | 0.16 | 0.98 | <0.01 | <0.01

See footnote in table above describing Unadj.P and Adj. P.

---January---

---|---|---|---|---
Year 4 Syst. 1 vs 2 | 0.69 | 1.00 | 0.16 | 0.97
Year 4 Syst. 1 vs 3 | 0.24 | 1.00 | 0.78 | 1.00
Year 4 Syst. 2 vs 3 | 0.13 | 0.76 | 0.24 | 1.00
Year 8 Syst. 1 vs 2 | 0.45 | 1.00 | 0.84 | 1.00
Year 8 Syst. 1 vs 3 | 0.88 | 1.00 | 0.36 | 1.00
Year 8 Syst. 2 vs 3 | 0.37 | 1.00 | 0.03 | 0.18

See footnote in table above describing Unadj.P and Adj. P.

---March---

---|---|---|---|---
Year 4 Syst. 1 vs 2 | 0.66 | 1.00 | 0.11 | 0.67
Year 4 Syst. 1 vs 3 | 0.43 | 1.00 | 0.01 | 0.08
Year 4 Syst. 2 vs 3 | 0.77 | 1.00 | 0.23 | 1.00
Year 8 Syst. 1 vs 2 | 0.17 | 1.00 | 0.16 | 0.97
Year 8 Syst. 1 vs 3 | 0.01 | 0.09 | <0.01 | <0.01
Year 8 Syst. 2 vs 3 | 0.16 | 0.98 | <0.01 | <0.01

See footnote in table above describing Unadj.P and Adj. P.
Supplemental Figure 10. (A,B,C) Cover crop shoot carbon to nitrogen ratios total, rye, and legume cover crop shoot biomass for three systems during January and March harvests in in Years 4 and 8, and (D,E,F) the difference between harvests in the Salinas Organic Cropping Systems trial at Salinas, CA. By seed weight the legume-rye cover crop increased 90% and 10% rye. Systems are in order (from left to right) of increasing organic matter inputs: System 1 - Winter fallow (‘Fal’) for years 1 to 3, and 5 to 7, cover cropped during years 4 and 8, without compost (‘NoCp’); System 2 - Same as System 1 but received annual compost additions; System 3 - Cover cropped annually with annual compost additions. Raw data points are shown as circles, squares or triangles clusters and are in order of replicates 1 to 4 for each data cluster. The vertical bar within each data cluster is the 95% confidence interval with the mean at the central horizontal line on the bar. Comparisons between independent treatment means (i.e., between systems within year and harvest) can be made using the ‘rule of eye’ method (Cumming and Finch, 2005) whereby confidence intervals that overlap with a mean are not different, and intervals that overlap by half of one interval arm are significantly different at P≈0.05 where sample size (n) ≥ 10; where n=3, CI overlap can be 1 arm length for a significant difference of P≈0.15 are highlighted in blue.

ANOVA P-values

March

Year <0.01
Syst. 0.12
YxS 0.25

January

Year 0.09
Syst. 0.12
YxS 0.28

ANOVA P-values

March

Year <0.01
Syst. <0.01
YxS 0.37

January

Year 0.01
Syst. 0.07
YxS 0.74

ANOVA P-values

March

Year <0.01
Syst. 0.11
YxS 0.23

January

Year <0.01
Syst. 0.98
YxS 0.29

---January---

Year 4 Syst. 1 vs 2 0.56 1.00 0.92 1.00
Year 4 Syst. 1 vs 3 0.69 1.00 0.31 1.00
Year 4 Syst. 2 vs 3 0.85 1.00 0.36 1.00
Year 8 Syst. 1 vs 2 0.22 1.00 0.42 1.00
Year 8 Syst. 1 vs 3 0.02 0.09 0.02 0.09
Year 8 Syst. 2 vs 3 0.18 1.00 0.06 0.37

---March---

Year 4 Syst. 1 vs 2 0.49 1.00 0.03 0.19
Year 4 Syst. 1 vs 3 0.36 1.00 <0.01 0.02
Year 4 Syst. 2 vs 3 0.81 1.00 0.23 1.00
Year 8 Syst. 1 vs 2 0.03 0.16 0.10 0.60
Year 8 Syst. 1 vs 3 <0.01 0.01 <0.01 0.01
Year 8 Syst. 2 vs 3 0.09 0.53 0.02 0.10

---Final---

Year 4 Syst. 1 vs 2 0.48 1.00 0.24 1.00
Year 4 Syst. 1 vs 3 0.74 1.00 0.77 1.00
Year 4 Syst. 2 vs 3 0.31 1.00 0.37 1.00
Year 8 Syst. 1 vs 2 0.68 1.00 0.08 0.49
Year 8 Syst. 1 vs 3 0.67 1.00 0.31 1.00
Year 8 Syst. 2 vs 3 0.40 1.00 <0.01 0.08

See footnote in table above describing Unadj P and Adj P.