Supplementary material

1. Relationship among soil GHG fluxes and soil variables

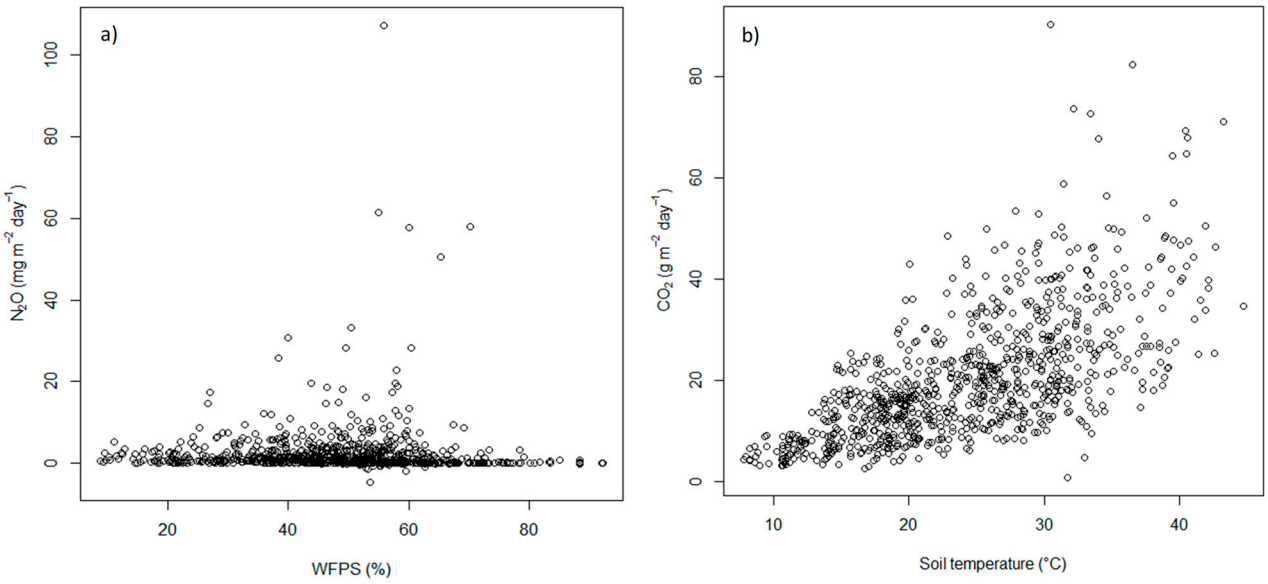

Figure S1. (**a**) Relationship between WFPS and N_2O daily flux; (**b**) relationship between soil temperature and CO_2 daily flux.

2. Determination of C:N of green manure mixtures in ORG

The ORG system included a spring green manure mixture incorporated into the soil before the transplanting of summer lettuce, composed of field peas (*Pisum sativum* L.) (300 kg seeds ha^{-1}) and faba beans (*Vicia faba* subsp. *minor* L.) (293 kg seeds ha^{-1}), and a summer green manure mixture, chopped and incorporated into the soil before fennel transplanting, composed of red cowpeas (*Vigna unguiculata* L. Walp) (25 kg seeds ha^{-1}), buckwheat (*Fagopyrum esculentum* L.) (35 kg seeds ha^{-1}), millet (*Panicum miliaceum* L.) (25 kg seeds ha^{-1}) and foxtail millet (*Setaria italica* L.) (25 kg seeds ha^{-1}).

Two areas of 1.5 m^2 per plot were sampled before the green manure incorporation to assess the biomass weight. Then, subsamples were dried at 60 °C until constant weight to determine the dry weight of biomass. Average N concentration in plant biomass was determined by the Kjeldahl method. The values of C:N of spring and summer green manure were calculated considering the carbon and nitrogen amounts in the biomass of each crop that composed the mixture, starting from the values of C:N reported in literature for each cover crop before incorporation in soil (Table S1).

Table S1. Bibliographic references for C:N of each crop in the green manures.

Bibliographic reference	Crop	C:N
Creamer and Baldwin, 2000	Red cowpea	21
Creamer and Baldwin, 2000	Buckwheat	21
Abdul-Baki et al., 1997	Foxtail millet [1]	43
McKenna et al., 2018	Faba bean	11
Parr et al., 2011	Field pea	15

[1] The same value was considered valid also for millet.

Table S2. Estimated values of C:N for the green manure mixtures (ORG) during the field experiment period.

Year	Spring green manure	Summer green manure
2014		33.5
2015	12.4	32.1
2016	12.8	33.8

References

1. Abdul-Baki, A.A.; Morse, R.D.; Devine, T.E.; Teasdale, J.R. Broccoli production in forage soybean and foxtail millet cover crop mulches. HortScience **1997**, 32, 836–839.
2. Creamer, N. G.; and Baldwin, K. R. An evaluation of summer cover crops for use in vegetable production systems in North Carolina. HortScience **2000**, 35, 600–603.
3. McKenna, P.; Cannon, N.; Conway, J.; Dooley, J. The use of red clover (Trifolium pratense) in soil fertility-building: A Review. Field Crops Res **2018**, 221, 38-49.
4. Parra, M.; Grossman, J. M.; Reberg-Hortonb, S.C.; Brintonb, C.; Crozier, C. Nitrogen Delivery from Legume Cover Crops in No-Till Organic Corn Production. Agron. J. **2011**, 103, 1578-1590.