

Burning of maize crop residues and weeds leads to major losses of C, N, P and K

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CONCLUSION

Average losses during burning equalled 97% C, 92% N, 25% P and 45% K.

High rates of fertiliser and manure needed to replace this.

BACKGROUND

Most farmers in NW Vietnam burn crop residues to control weeds, pests and facilitate planting (Fig. 1).

- How much C, N, P and K is lost?
- Implications for soil health?

METHOD

Survey identified 2×2 main farmer practices to be mimicked:

- Burning after harvest (autumn) or before planting (spring)
- Burning plant matter heaped or scattered (as after harvest)

Trial:

- Burning on flat and smoothed surface of clay soil (Fig. 2)
- Residues and weeds weighed, burnt, then ash collected and weighed
- Plant and ash C, N, P, K determined



Fig. 2. Burning carried out on a day with no wind and rain. Plant matter equalling amounts in neighbour field was burnt heaped or scattered (n=4).

RESULTS

- Most of C and N was lost at both times and with both methods (Fig. 3, 4)
- P and K losses lower but still considerable
- As a result of one burning
C loss = 2-2.5 t ha⁻¹
N & K loss = ca 30 kg ha⁻¹
P loss = ca 1 kg ha⁻¹

DISCUSSION

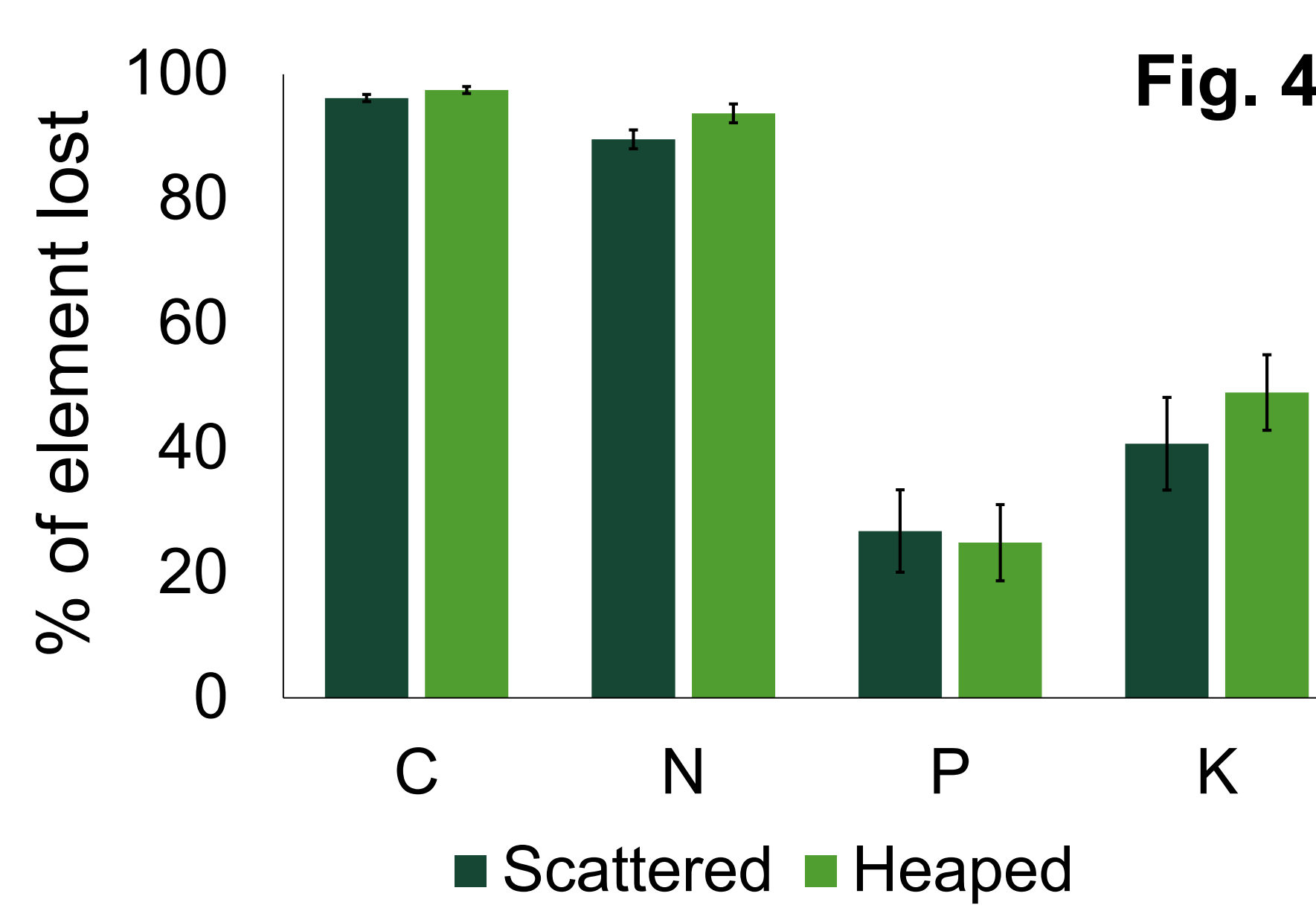
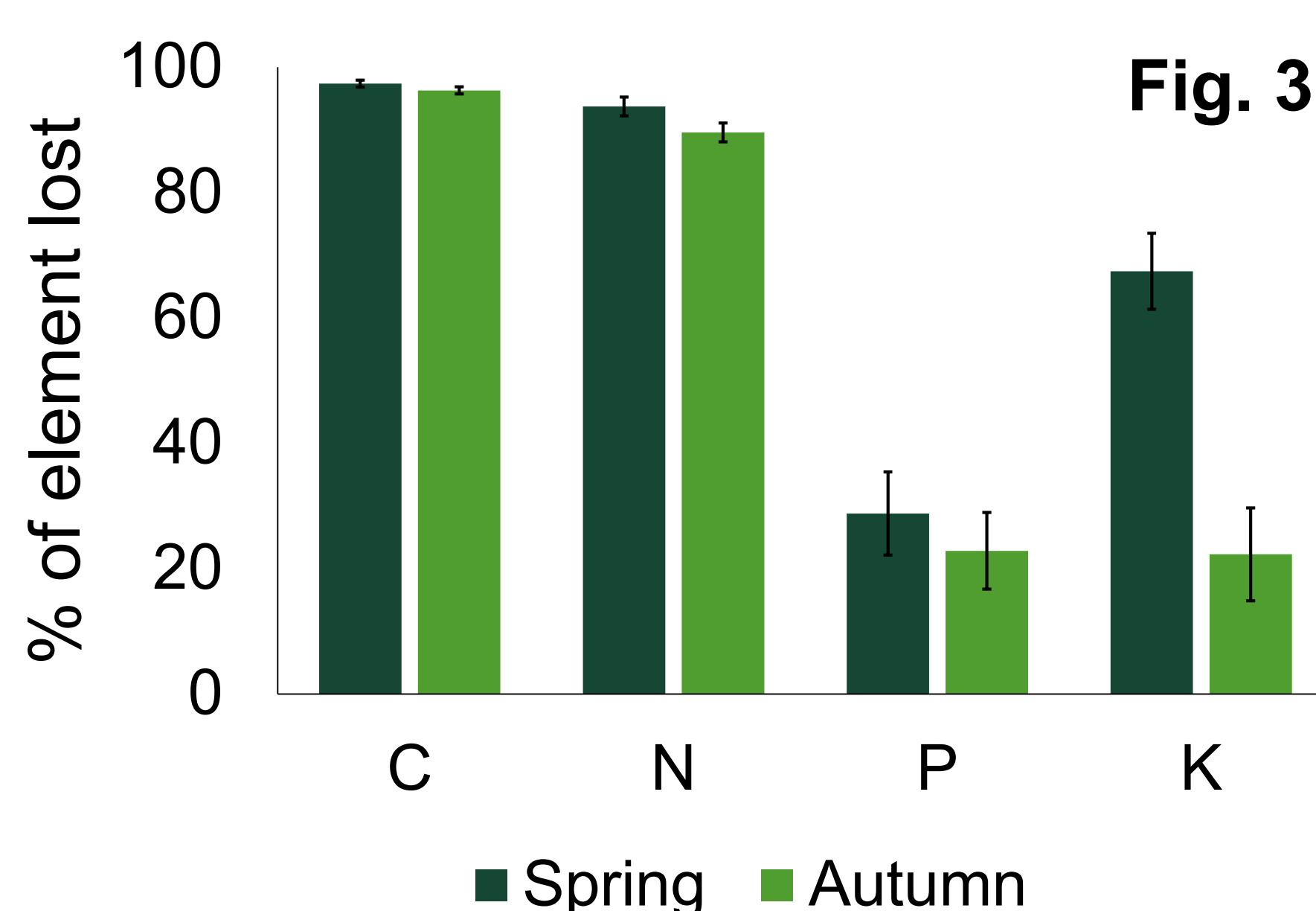
Replacing lost nutrients incurs costs - hard for many smallholder farmers.

Loss of C will reduce soil health, its water and nutrient holding capacity and increase risk of erosion.

New technologies and cropping systems needed to stop burning.



Fig. 1. Hillside fields after burning. Soil and ash exposed to further losses by rain and wind.



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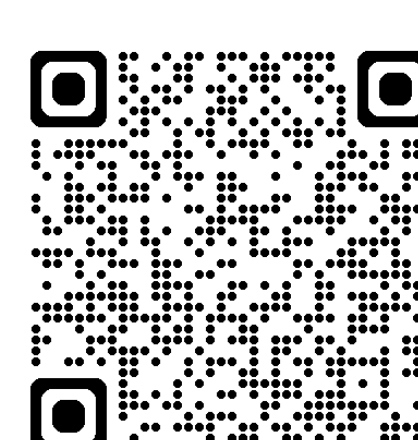
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