

Efficiency of different bare fallow strategies to control perennial weeds

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What did we do and why?

- Bare fallow can occasionally be needed in organic crop rotations to control perennial weeds (e.g. *Elymus repens*, *Cirsium arvense*, *Sonchus arvensis*)
- There is need to intensify the fallowing strategies and to shorten the fallowing time
- We tested three shortened fallowing strategies
- The target in a *E. repens* experiment was to find out the most effective tillage methods in late summer fallow when old ley is broken up during July – September
- The target in *C. arvense* and *S. arvensis* experiments was to explore efficiency of Kwick-Finn (KF)-cultivator in May – June bare fallow and in stubble cultivation after cereal harvest
- Weed samples were taken next year just before cereal harvest

What did we find out?

- In *E. repens* experiment the KF- weed-cultivator destroyed *E. repens* effectively; on average 5% of *E. repens* remained alive compared to untreated control (Fig. 2)
- Also “ordinary” tined cultivator was rather effective, but it left field surface rugged for the next passes
- Frequent mowing (7 times per summer) destroyed about half of *E. repens*
- In *C. arvense* experiment shortened fallow with KF-cultivator during May – June destroyed *C. arvense* very effectively (Fig. 3)
- In *S. arvensis* experiment stubble cultivation was surprisingly effective, although weed pressure was not as high as in other experiments (Fig. 4)
- In well designed crop rotation shortened and intensified fallow may be needed every fifth year or rarely
- Determining the optimum number of passes and minimizing environmental effects require further research



Figure 1. Kwick-Finn cultivator lifts the roots or rhizomes of perennial weeds to the soil surface so that sun and wind can desiccate them. Goosefoot tines loosen the soil and after that a PTO-driven rotor throws soil and weed roots into the air.

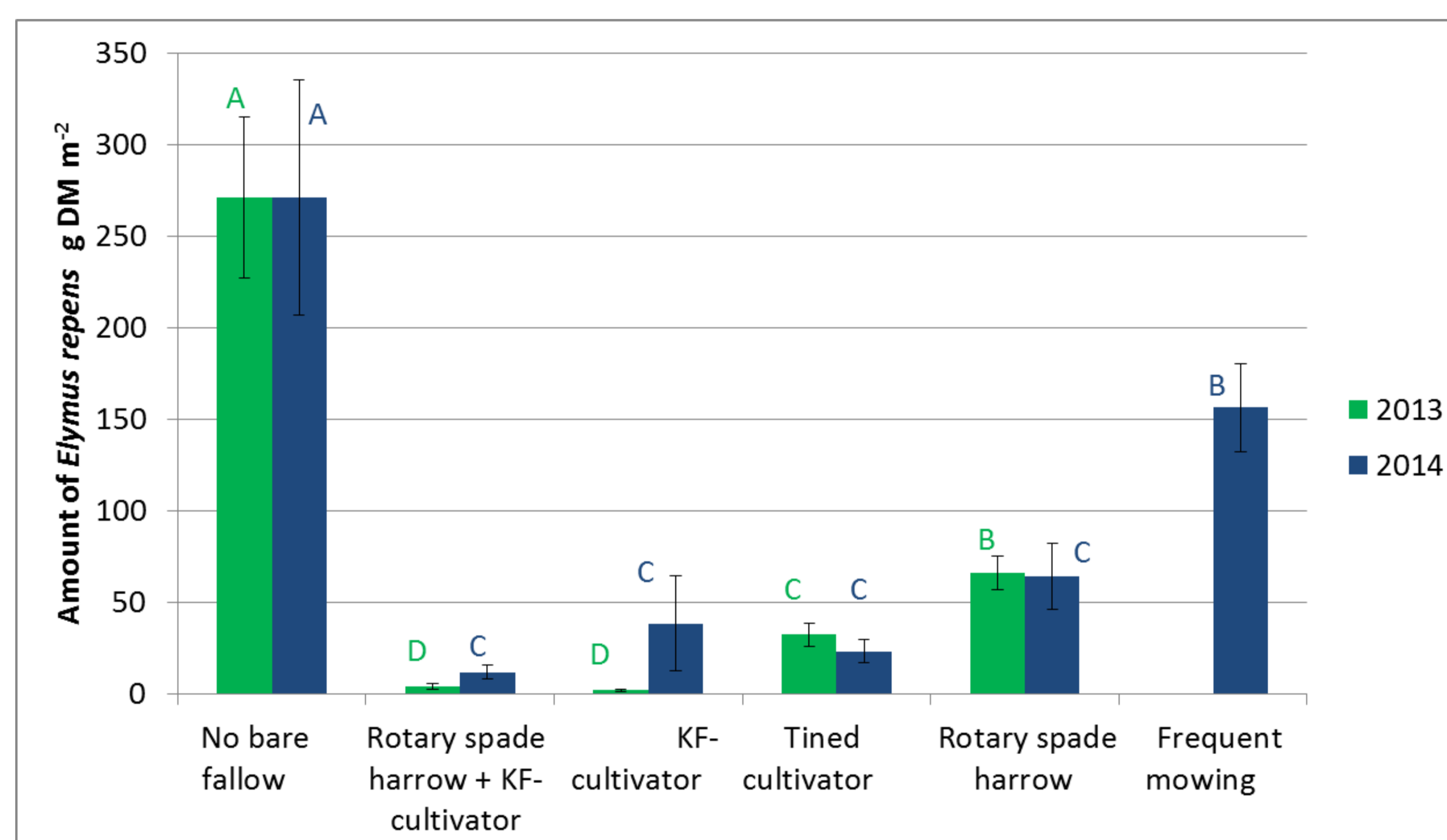


Figure 2. Amounts of *E. repens* one year after fallow treatments just before cereal harvest. Strategy was: Breakage of old ley and bare fallow after that (July – September). Peat / mould soil. The number of passes with machinery were 4 – 6 per summer. Bars = Standard deviations (n=4).

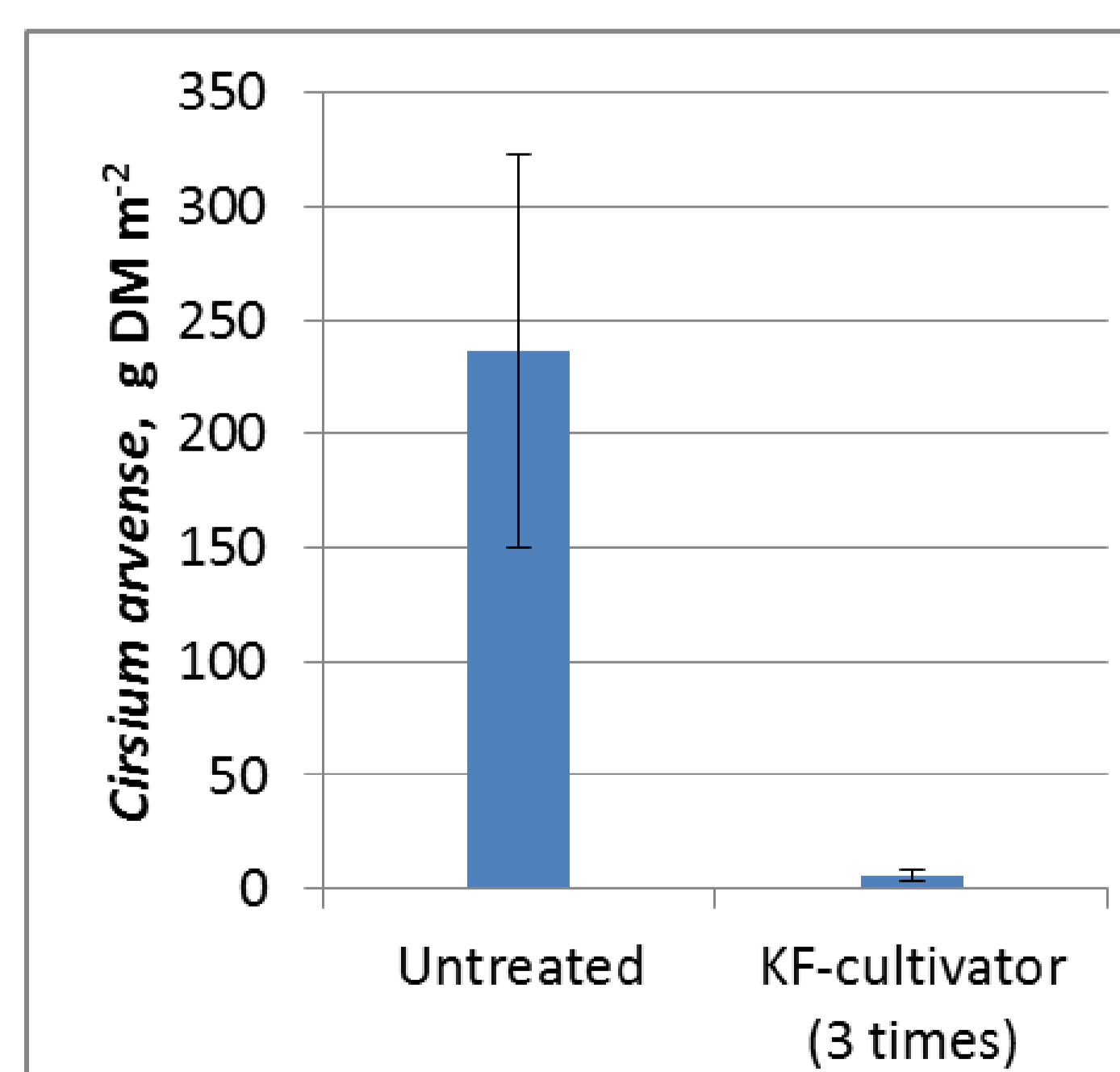


Figure 3. Amount of *C. arvense* just before cereal harvest. Strategy was: 3 passes with KF-cultivator during May - June followed by sowing green manure crops. Silty clay soil. Bars = Standard deviations (n=4).

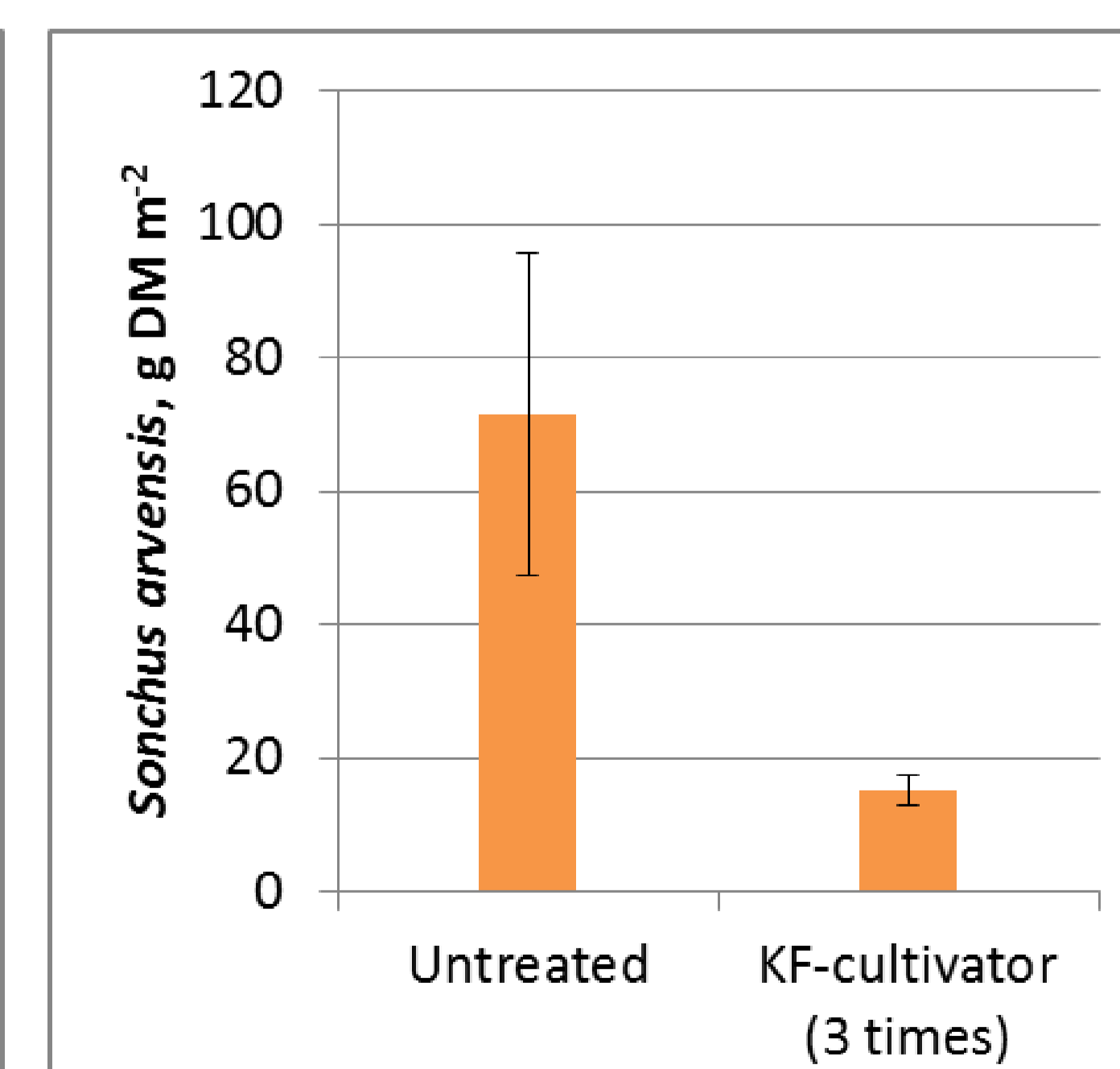


Figure 4. Amount of *S. arvensis* just before cereal harvest. Strategy was: two passes with KF-cultivator after cereal harvest and one before drilling in next spring. Coarse sand soil. Bars = Standard deviations (n=4).