Why was this study conducted?

➢ Large costs are annually involved in evaluating the usefulness of new on-farm weed control techniques.

➢ However, conventionally used data collection and analysis reach relatively scant information mainly due to temporal and spatial uncontrolled variations[1,2,3].

➢ To circumvent these variations, we evaluated if new methods such as repeated assessments of visual percentage ground cover and multivariate methods were to add value to the information.

How was the evaluation done?

Material: Two on-farm field trials
➢ Klostergården: Test of herbicides
➢ Tegneby: Test mechanical implements

Method: Comparison between conventional data collection and analyses with new ones.

1. Data collection:
➢ Conventional method consisted of one sampling time of the above ground biomass
➢ New method was a repeated assessments of visual ground cover (%): one before plus several after the treatment

2. Data Analyses:
➢ ANOVA
➢ Repeated Measures ANOVA (rmANOVA)
➢ Multivariate method: Partial Redundancy Analysis (pRDA)

What did we find?

➢ ANOVA for both weed biomass and percentage ground cover reached similar outcomes: Test of significance, ranking of treatments in terms of their effectiveness and groupings

➢ Correlation analysis between above ground biomass and ground cover (%) showed a positive relationship of r≥ 0.71

➢ Data sets analysed with ANOVA, rmANOVA and pRDA reached similar outcomes

➢ RmANOVA using ground cover (%) highlighted treatment effect and temporal changes (Figure 1)

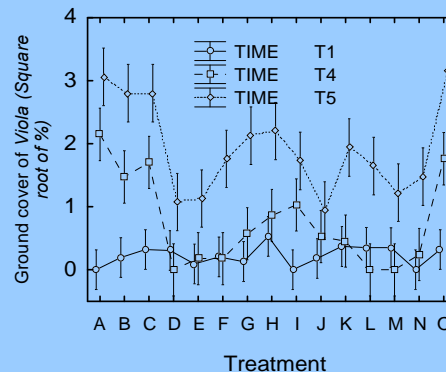➢ PRDA allowed to illustrate each weed species response to different treatments (Figure 2)

Figure 1: Square root of mean percentage ground cover of viola (with 95 % confidence interval) with respect to interaction between treatments and time factors at Klostergården. T1, T4 and T5 represent sampling occasions
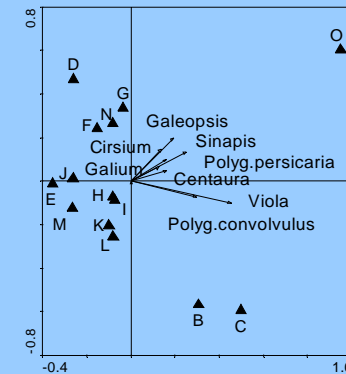

Figure 2: Weed species – treatments biplots in a ordination space (pRDA) at Klostergården. Letters represent treatments and arrows are weed species.

Conclusions

➢ Visual assessment of percentage ground cover can be regarded as surrogate of biomass estimate

➢ rmANOVA adds more value to the information drawn from the trials. Besides the similar ranking reached with ANOVA, they allow to follow weed abundance dynamics before and after treatment

➢ pRDA goes even further highlighting the treatment effect species-wisely

References

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3. Walter AM, Christensen S & Simmelsgaard ES (2002) Spatial correlation between weed species densities and soil properties. Weed Research 42, 26-38