



Forest Energy in Action



WG2 – Operations research and measurement methodologies

Good Practice Guidelines



N. Magagnotti, R. Spinelli

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Joensuu, 28 August 2013**

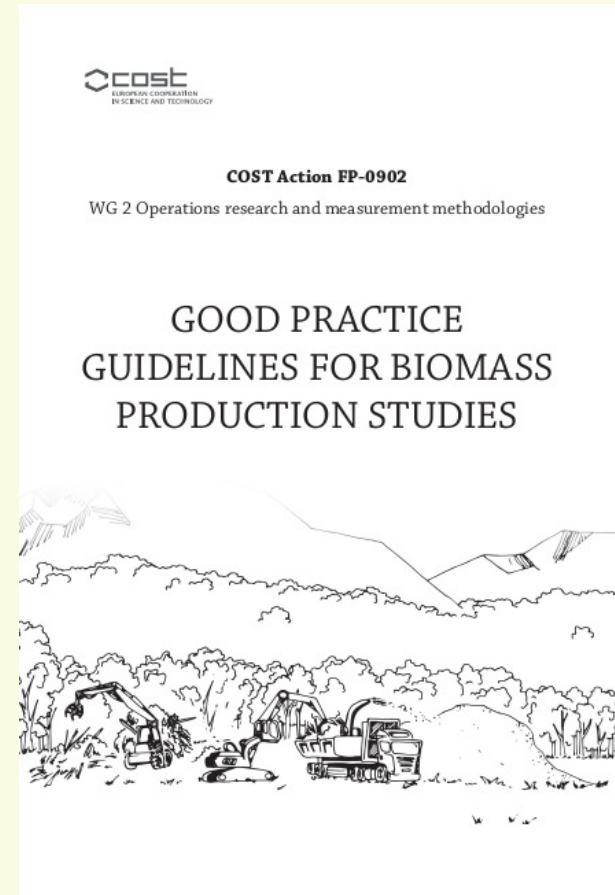


Mission

- Summarize the current methodologies and procedures in regards to work studies, the current sampling methods and standard measurements for different types of forest energy material.
- The purpose is to a) survey, b) analyze, c) categorize and d) compare the different and numerous work study methodology, sampling methods and standard measurement approaches in participating countries.
- The final goal is not to produce one standard procedure valid for all situations but...

Output

Best practice guidelines for biomass production studies



GPG – first step

- Survey of work study methods used by WG members institutions and countries
- Draft version for the meeting
- Meeting in Trento
 - ✓ revision of contents and structures of the document

GPG – second step

- Assemble the final version of GPG
- Send the final version to a QAG
- Meeting in Graz
 - ✓ official adoption of the GPG
 - ✓ planning for their adoption
- Training School in Brno
 - ✓ two versions were tested

GPG – third step

- Print the approved version of GPG
- Meeting in Portalegre
 - ✓ Official presentation of the final version of the GPG and distribution of the hard copies
 - ✓ Dissemination
 - ✓ Implementation
 - ✓ Feedback

COST Action FP0902 – WG2

Meeting Agenda

Istituto Politécnico de Portalegre - - Portalegre, Portugal

Thursday September 20th, 2012

9:00 – 10:30

Item 1. Welcome to participants
Item 2. Presentation of the GPG – delivering paper copies
Item 3. Feedback from WG2 participants (any comments you have)
Item 4. Ideas for implementation and validation, inside and outside COST group

Coffee Break

11:00 – 12:30

Item 5. Ideas for implementation – proposals by participants
Item 6. Ideas for validation – proposal by participants

Lunch

14:00 – 15:00

Item 7. Drawing a summary implementation and validation plan
Item 8. Any other business

GPG – Table of contents

1. Introduction
 2. Background
 3. Work measurement
 4. Before you start
 5. Measurement in the field
 6. Data analysis
 7. Conclusive notes
 8. Relevant bibliography
- Appendix

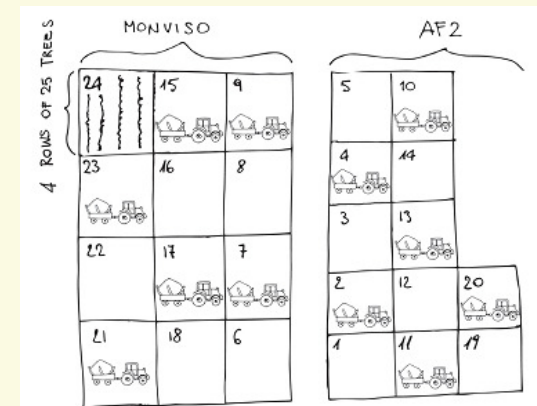
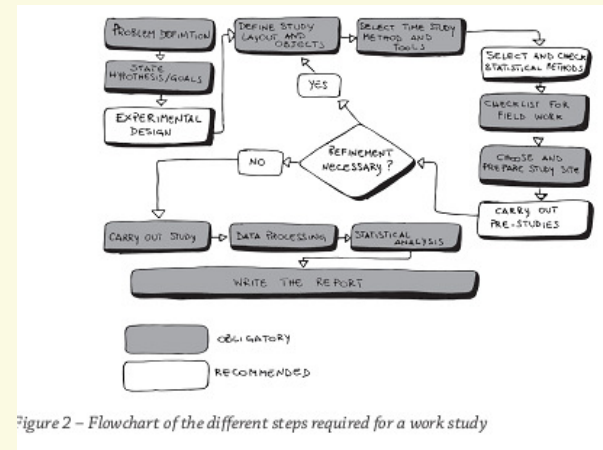
GPG – Table of contents

➤ Work measurement

- ✓ Statistics
- ✓ Study types

➤ Before you start

- ✓ Study goal
- ✓ Experimental design
- ✓ Formulating a statistical model
- ✓ Defining what to measure and how
- ✓ Practical rules



GPG – Table of contents

➤ Measurements in the field

- ✓ Measuring time input
- ✓ Measuring energy input
- ✓ Measuring product output
- ✓ Measuring energy output
- ✓ Measuring quality output
- ✓ Measuring process variables

Box 9 - Measuring extraction distance

Extraction distance is a key independent variable in biomass extraction studies. Distance can be measured with several instruments, including: tape measure, hip chain, pacing, laser range-finder, machine odometer, GPS, map coordinates. It is always very important to indicate how distance was determined and if the distance reported is the map distance or the actual slope distance. It is also important to specify whether extraction occurred uphill or downhill.



Collecting time data

GPG – Table of contents

➤ Data analysis

- ✓ Descriptive statistics
- ✓ Checking for outliers
- ✓ Checking for normality
- ✓ Data transformation
- ✓ Making comparisons
- ✓ Modelling

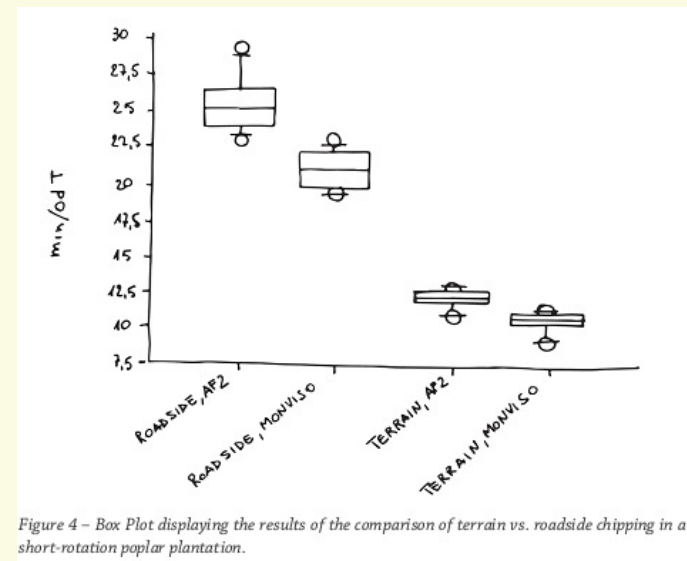


Figure 4 – Box Plot displaying the results of the comparison of terrain vs. roadside chipping in a short-rotation poplar plantation.

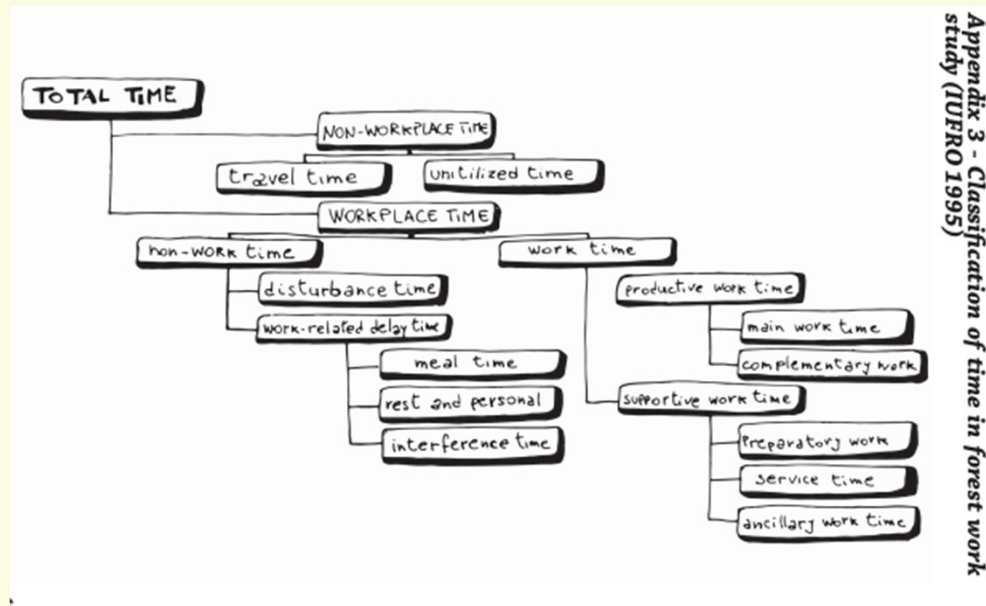
Box 10 - Statistical packages

A number of different statistical packages can be used for analyzing the data collected in forest work studies, and among them some of the most common are: SAS, SPSS, Minitab, R for Excel. They offer similar results but vary in cost and user-friendliness. R for Excel is a good tool, with a large capability and is freely available to all, although it takes some learning before it can be used correctly. The others are available at a price (from very moderate to high) and are generally quicker to master.

GPG – Table of contents

➤ Appendix

- ✓ Work science: definitions
- ✓ Example of the main parameters most capable of effecting harvesting performance
- ✓ Classification of time in forest work study (IUFRO 1995)



Parallel activities

➤ Dissemination

- ✓ Formec (HR 2012), Oscar (LV 2012), ExpoBioEnergia (ES 2012), National Conference on forest biomass harvesting for energy (PL 2012), Conference on forest technology and technique (PL 2013)
- ✓ Posted on www.forestenergy.org for free-download
- ✓ Linked to a page on Wikipedia http://en.wikipedia.org/wiki/Time_and_motion_study
- ✓ International Scientific Workshop “Work studies in forest” (IT 2013)

➤ Implementation

- ✓ GPG quoted as reference of scientific manuscript (so far at least 5)

➤ Feedback

- ## ➤ Review study to explore current work study methodologies and protocols

Impacts

- Simple and quick how-to guide
- Avoid misunderstanding about time study methodologies, better R&D, increased viability of forest energy
- Hints of safety and ethics
- Comparability of results and repeatability of experiments
- Facilitate international network building
- Reliable, robust data to support policy making and management decisions at local and global level

Conclusions

- Common platform accessible by all
- Simple, clear and comprehensive
- Harmonization
- Advice

Improve exchange and connections between
researchers of different countries

The future

- Continuation
- Improvement and dissemination
- Wiki-platform?
- Time-study software?
- Data analysis software?
- Translations?
- Concerted strategy with other WGs

...and finally

- Let us thank all WG2 and country delegates for:
 - your very useful and constructive discussion during the meetings
 - your patience
 - your efforts to the GPG

Download & Contacts

- http://www.forestenergy.org/pages/wg_2
- magagnotti@ivalsa.cnr.it
- spinelli@ivalsa.cnr.it