

## OVERVIEW OF THE TUNING TEMPLATE REGARDING THE FIRST TWO LINES IN THE SUBJECT AREA OF AGRICULTURAL ENGINEERING IN EUROPE

### **Summary of preliminary outcomes as developed by USAEE**

Tuning has developed reference points for common curricula on the basis of agreed competences and learning outcomes as well as cycle level descriptors for many subject areas in order to enhance recognition and European integration of diplomas, taking into consideration the diversity of cultures.

The overview of the two lines that were developed within the 8<sup>th</sup> USAEE Workshop papers to be included in the corresponding proceedings, entitled “*Tools for quality assurance and assessment of Agricultural Engineering programmes, Tuning subject-area lines and Disappearing rare knowledge*“, and presented on September 7, 2006 in Bonn are the following:

#### **i. Introduction to the subject area**

Agricultural engineering is the scientific discipline related to the production and processing of goods of biological origin from the field and the farm to the consumer (i.e. plant and animal production, post-harvest technology, process engineering, etc.). It is also related to the protection of the natural environment and the preservation of the natural resources (i.e. soil conservation, rational water management, air pollution control, waste management, preservation of natural habitats, etc.).

#### **ii. Degree profiles and Occupations**

##### ***Typical degrees offered in the subject area***

- First cycle in (name subject area / specific parts)

Agricultural Engineering  
Agricultural Biosystems & Technology  
Agrotechnology & Food Sciences  
Agroenergetics  
Agricultural Mechanization  
Agricultural & Environmental Engineering  
Biosystems Engineering  
Horticulture Engineering

- Second cycle in (name subject area / specific parts)

Various specializations (usually mixture of course work and a substantial thesis component) related to the subject areas of the first cycle (i.e. Farm Machinery, Bioprocessing, Materials, structures and environment, Energy sources, Information technology and automation, Waste management, Water resources engineering, etc.)

or

- Integrated First and Second cycle in (name subject area / specific parts)

Agricultural Engineering  
Agricultural Biosystems & Technology  
Agroenergetics  
Agricultural Mechanization  
Biosystems Engineering

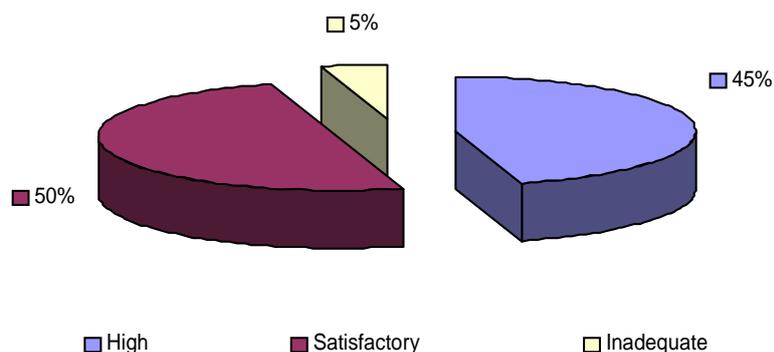
- Third cycle in (name subject area / specific parts)

Any specialised topic of Agricultural Engineering interest (usually requiring examination and defence of a substantial and original piece of research described in a comprehensive thesis)

### ***Typical occupations of the graduates in the subject area of Agricultural Engineering in Europe***

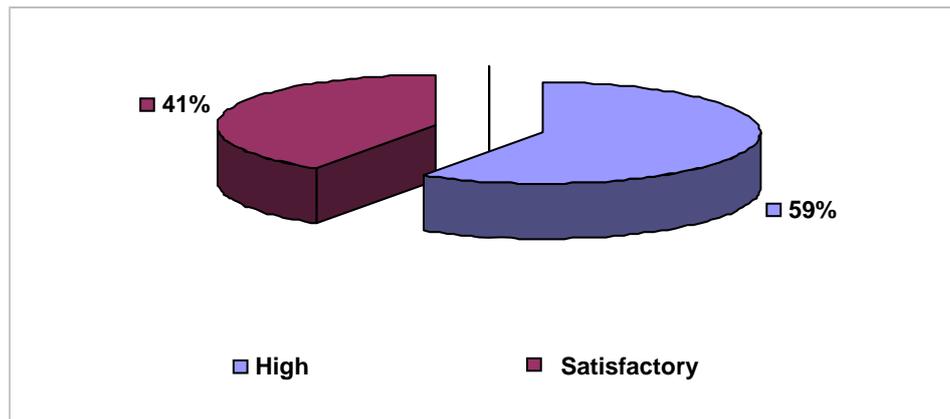
On January 2006 a questionnaire was developed and distributed among the USAEE partnership in order to visualize the status of the Agricultural Engineering profession in their own countries as related mainly to the competences and employability skills of the graduates. The responses gathered from twenty-one Socrates supported partners and one non-Socrates country (Russia); in total twenty countries, unambiguously demonstrate the status of the profession nowadays at a European level.

One of the issues raised was whether Agricultural Engineers graduates are appropriately educated so as to keep pace with the needs and demands of the labour market. The outcomes have shown that in the majority of cases graduates are considered to be highly or satisfactorily educated (Figure 1).



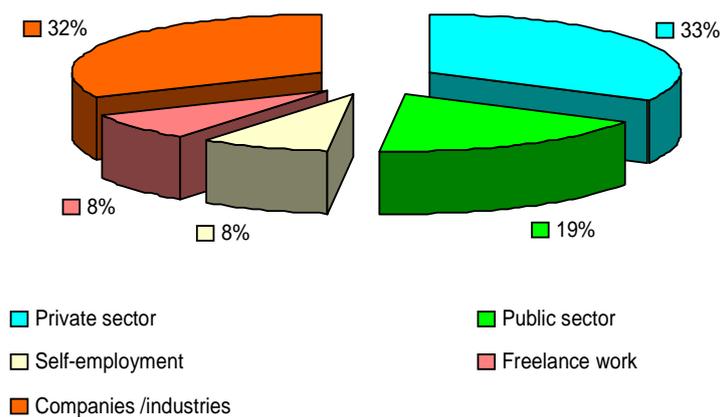
**Figure 1.** Agricultural Engineering graduates are appropriately educated so as to enter the relevant labour market.

In terms of more generic competences Agricultural Engineering graduates are considered, bearing a percentage of 59%, highly educated with regards to the needs of the broader labour market (Figure 2).



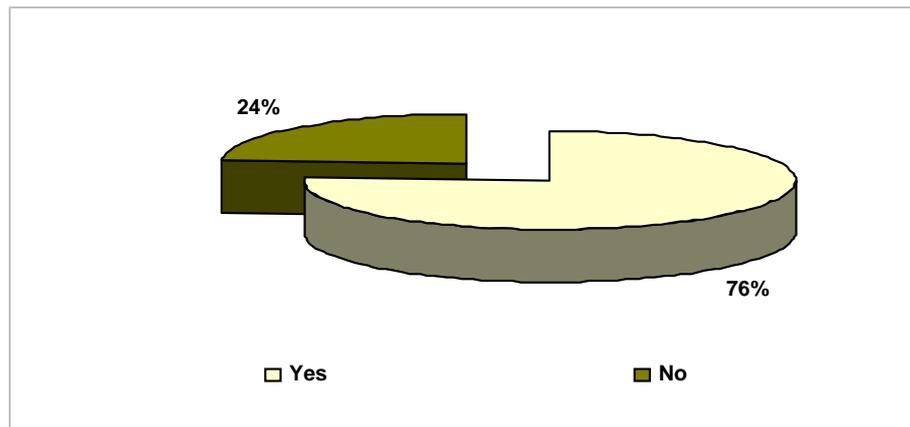
**Figure 2.** Agricultural Engineering graduates are appropriately educated in terms of more generic competences so as to enter the broader labour market.

In Europe, the two sectors of economy in which Agricultural Engineering graduates might easily find an occupation are: the *private sector* and in *companies/industries* with almost the same percentage (33% and 32% respectively). 19% of graduates are working in the *public sector* and/or for the *government* and fewer (8%) are either *self-employed* or *freelancers* (Figure 3).



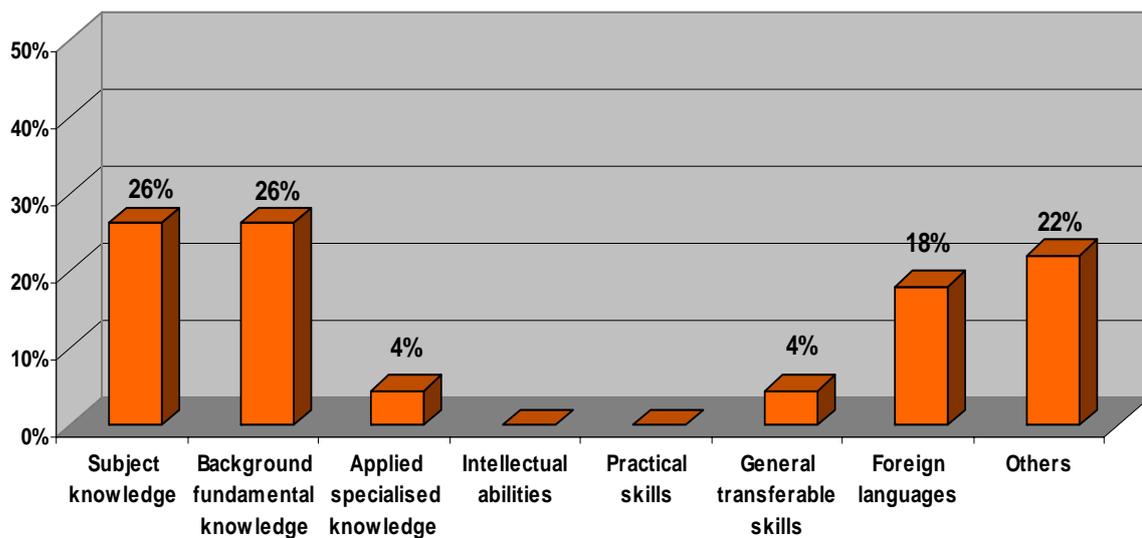
**Figure 3.** Sector of economy in which Agricultural Engineering graduates are employed.

76% of graduates are employed in subject-areas related to their degree (Figure 4) and the most relevant area of their involvement is primarily the *Engineering area*, and occupations relevant to Agronomy or Environment ensue. However, in fewer cases they are also involved in technological applications not requiring university studies.

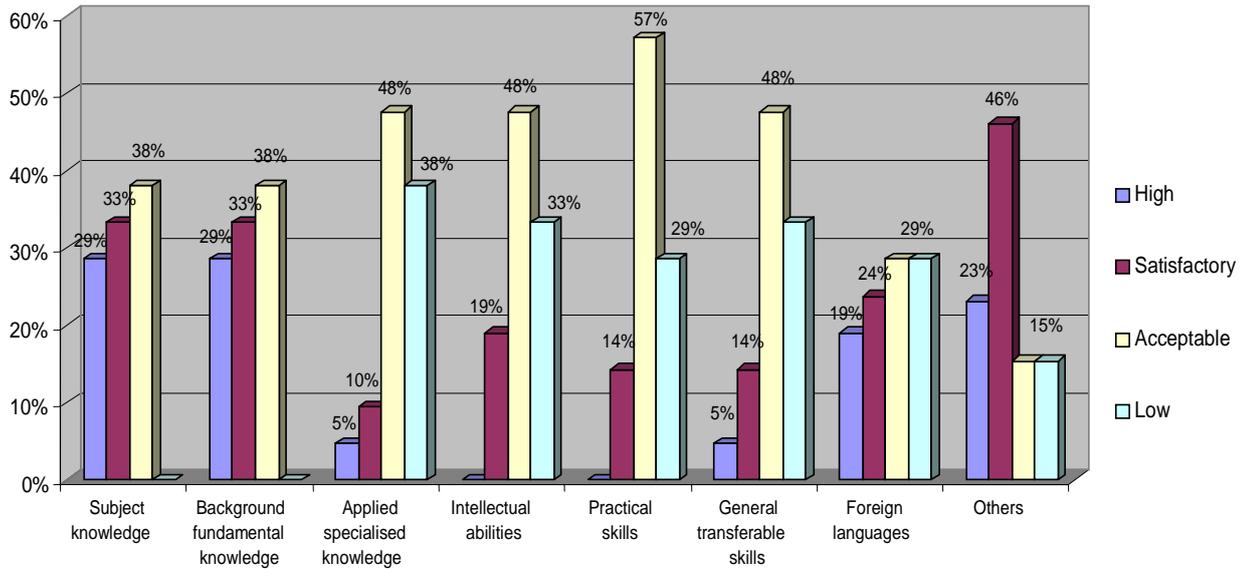


**Figure 4.** Graduates employed in subject-areas related to their degree.

The two most useful competences to enter the job market are those related to *Subject knowledge* and *Background fundamental knowledge* (both with a percentage of 26%). A percentage of 22% replied *Other* competences, whereas *Foreign languages* are also considered to be a useful tool. *General transferable skills* and *Applied specialised knowledge* hold the lower position (Figure 5 & 6).

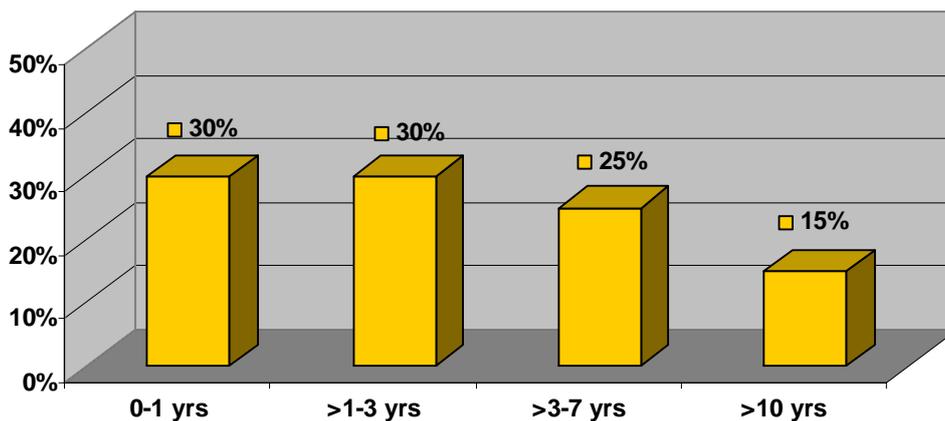


**Figure 5.** Competences considered most useful so as to enter a job.



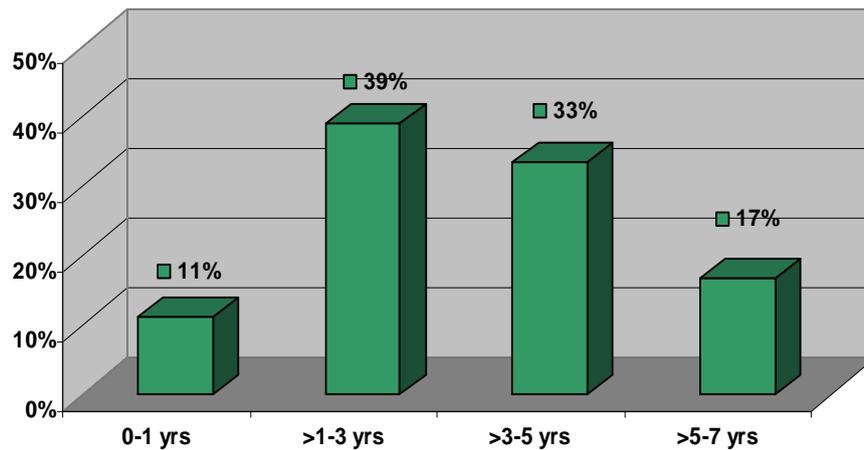
**Figure 6.** Competences needed to find a job (presented in a rank depending on competences' usefulness).

In the majority of cases the estimated time for a graduate to find a job for the first time after his/her graduation varies between 0 and 3 years. However, of major significance is the finding that one out of four graduates is employed in a discipline related to his/her degree after three to seven years. This actually depicts the necessity of reforming straightway the Agricultural Engineering programme of studies, making it more flexible, coherent and responsive to the needs and demands of the modern society. A relatively important percentage of 15% *unfortunately* cools their heels for more than ten years after graduation (Figure 7).



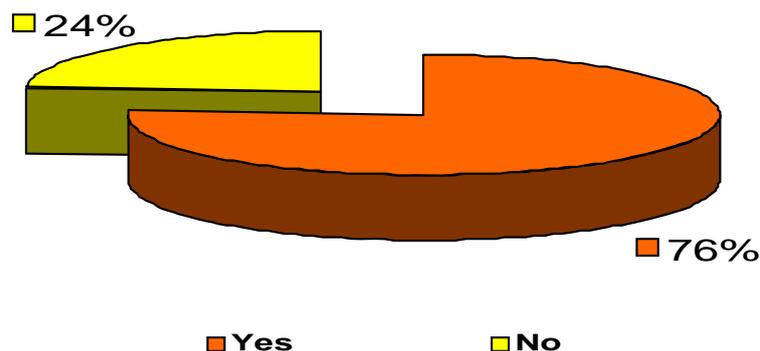
**Figure 7.** Years after graduation for a 1<sup>st</sup> time employment in a discipline related to the degree.

A high percentage of 39 % of graduates switch their job every one to three years and a relatively equal percentage, namely 33%, makes this decision a little bit later, every three to five years. 11% “chooses” more frequently to change their employment, namely at an annual basis, and 17% of them remains at the same position for more than five to seven years (Figure 8).



**Figure 8.** Frequency in switching jobs.

This survey has shown that roughly in the majority of cases eight or nine out of ten male students are mostly interested in Agricultural Engineering studies, whereas only the rest one or two (out of ten) female students show interest in such studies. Additionally, almost eight out of ten replies have shown that both genders have equal opportunities in finding a job with the same prospects after graduation (Figure 9).



**Figure 9.** Gender opportunities in finding a job with the same prospects after graduation.

### ***Role of subject area in other degree programmes***

Agricultural Engineering courses are quite often offered to support other degree programmes, the aim being to allow students from other disciplines to acquire competences which can be proven helpful in a “holistic” approach of everyday issues. Some examples of such programmes are given below:

- *Plant Science* (e.g. Protected Plant Production, Micro-environment Control)
- *Animal Science* (e.g. Livestock Housing, Indoor Air Contaminant Measurement and Control, Waste Management)
- *Food Science* (e.g. Post-harvest Technologies, Crop Preservation)
- *Environmental Engineering* (e.g. Indoor Air Contaminant Measurement and Control, Waste Management)