

2nd International Symposium "NEW METROPOLITAN PERSPECTIVES" - Strategic planning, spatial planning, economic programs and decision support tools, through the implementation of Horizon/Europe2020. ISTH2020, Reggio Calabria (Italy), 18-20 May 2016

## Demetra: A survey on work safety in 103 agricultural farms in Friuli Venezia Giulia

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### Abstract

The objective of this study was to investigate current levels of work safety in agriculture, based on interviews conducted in a composite sample of 103 farms located in the region Friuli Venezia Giulia (North-East of Italy). The survey has outlined a number of patterns that were consistently found across all types of farms and only slightly varied depending on farm size, type of production and location. The results were used to define guidelines for safety experts on the field with new, updated approaches for risk assessment and accident prevention in the farms.

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Peer-review under responsibility of the organizing committee of ISTH2020

*Keywords:* Safety; Tractor; Farms.

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### 1. Introduction

Agriculture is one of the most hazardous sectors of economic activity in Italy, in relation both to injuries at the workplace and occupational diseases. More important, the frequency of fatal accidents is particularly high, although

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not well recognized since many of them involve unprofessional conditions such as retired persons or young people. This makes it very important to properly assess work safety conditions (Meeker, Carruth & Holland, 2002; ).

Specific surveys on health and safety conditions of working people have been conducted at both European and national level (Niskanen, Naumanen & Hirvonen, 2012a; Niskanen, Naumanen & Hirvonen, 2012b). Recently, the Ministry of Health has promoted a Research Programme on occupational safety and health. One of the priorities has been to establish a national, permanent infrastructure to monitor how workers awareness about risks at the workplace, consistently with the objectives of the National Health Service (Servizio Sanitario Nazionale; Inail, 2014; Cecchini, Colantoni, Massantini & Monarca, 2010; Marucci, Monarca, Cecchini, Colantoni & Cappuccini, 2013). This kind of investigation is based on telephone surveys involving both the workers and their employers. Another survey was conducted in the agricultural sector (Rete Rurale Nazionale, 2014) based on face-to-face interviews conducted by specialists (Proto & Zimbalatti, 2010; Proto & Zimbalatti, 2015). The legal framework in Italy has evolved in recent years, following the adoption in 2008 of Decreto Legislativo (Decree) n. 81 of April 9, 2008, on the regulation and enforcement of workplace health, safety and welfare. This fundamental text (Testo Unico), modified by Decreto Legislativo n. 106 of 2009, contains 306 articles and 51 attachments and introduces the principle of organisation in risk prevention, since both the employers and the workers are committed to safety management practices. Unlike other European legal standards (e.g. for food safety, environment protection of animal welfare), work safety standards are not part of the common rules for direct support schemes under the European common agricultural policy (Cecchini, Cossio, Marucci, Monarca, Colantoni, Petrelli & Allegrini, 2013).

However, compliance with work safety rules and national guidelines is required by many Italian Regions as a mandatory condition in order to apply for public support schemes, including those of the Rural Development Plans (Cecchini, Massantini, Frangipane, Monarca & Moscetti, 2011). As indicated by previous work, risk prevention and safety rules, while representing substantial requirements for any agricultural farm, are often difficult to introduce and partly still unattended in many cases (Cividino, Vello, Zucchiatti, Gubiani & Pergher, 2010, 2012, 2013, 2014, 2015). Thus, the first objective of this study was to investigate current levels of work safety in a sample of 103 agricultural farms located in the region Friuli Venezia Giulia (North-East of Italy). Another objective was to define guidelines for safety experts on the field with new, updated approaches for risk assessment and accident prevention in the farms.

## 2. Materials and methods

The data used in this study derived from two separate surveys, conducted to assess safety levels in the Animal husbandry sector and in the Vine growing – Wine producing sector in the Region Friuli Venezia Giulia. In the second case, a number of other farms with different specialisation or mixed production were also included. For the purpose of the present study, this made up a sample of 103 agricultural farms, with a prevalence of dairy farms and farms with vineyard and/or horticultural crops (Table 1).

Table 1 - The farm sample.

Type of farm	No.	%	Average size (ha)
Dairy farms	36	35.0	67.5
Other livestock	17	16.5	89.9
Vineyard and winery	24	23.3	55.6
Horticulture and nursery	12	11.7	9.4
Other	7	6.8	14.9
Mixed	4	3.9	240.5
Cereal crops	3	2.9	42.3
All farms	103	100.0	63.9

These farms were located in all of the six Health Districts in Friuli Venezia Giulia, each controlled by the

respective District Agency (Azienda per l'Assistenza Sanitaria, AAS). Part of these farms (56.3%) employed hired personnel, while 43.7% were family farms, allowed by the law to use a simplified safety management scheme.

Each of the farms was visited by one evaluator and all data were recorded following a specific questionnaire. This was divided in two areas (Fig. 1):

- area A, including general information about the farm;
- area B, which varied depending on farm specialisation, and was further divided into three profiles: B1: farm machinery; B2: personal protective equipment (PPE); B3: specific risks.

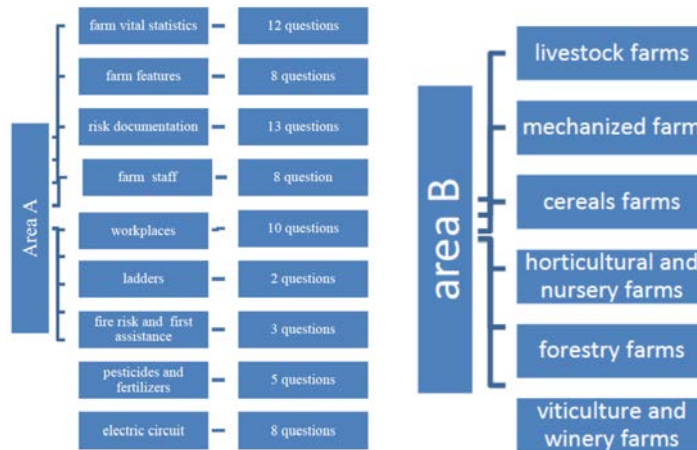


Fig. 1. Areas A and B.

### 3. Results

To the purpose of the present study, we analysed:

- whether official documents and records were actually present at the farm;
- how safety management was organised;
- the presence of protection devices on tractors;
- the use of prevention and protection equipment.

Table 2. Official documents at the farm.

Type of document	Missing or inadequate (% of farms)
Risk assessment document	34.5
Risk assessment update	44.8
Medical watch	34.5
Emergency procedures	41.4
Regular inspection record (lifting equipment)	44.8
Compliance certificate of equipment	10.3
Book of use and maintenance	8.6
Pesticide license	24.1
Pesticide safety sheet	25.9
Equipment maintenance plan	36.2

Table 2 includes only the 58 farms with external personnel, which are subjected to full application of Decreto

81/08 including official documentation. The main document required, i.e. the Risk assessment document, was absent or inadequate in 34.5% of the farms; other required documents were missing even more often, including a scheme for medical surveillance of workers (34.5), the scheme for emergency procedures (41.4%), and the record of periodic inspection of lifting equipment (44.8%). Only those documents provided by third parts were mostly present, such as the Compliance certificate (lacking in 10.3% of farms), the Book of use and maintenance of equipment (8.6%), the Pesticide safety sheet (25.9%), or those required for purchasing pesticides (Pesticide license: 24.1%).

Particularly remarkable was the absence of a plan for machinery and equipment maintenance (36.2%), because of its great importance for accident prevention. The law also requires every farm with hired personnel to officially appoint a number of figures in charge of the different protection and prevention services (Table 3). While a safety manager (or head of the prevention and protection service, PPS) was mostly present (82.8% of the farms), other figures were often missing, including a doctor designated for periodic medical surveillance (48.1% of farms), or the supervisors for fire prevention (33.3%), first aid (34.6%) and workers' safety during actual work (63.0%).

Additionally, 38.3% of the farms were not providing the workers with sufficient training and information services, while 44.3% did not have any special training for the various managers and supervisors. Most of the farms had adequate toilet and shower services and dressing rooms for the workers (Table 4). The width of the main entrance to the farm (minimum: 5 m) was mostly in line with the law. Protections on gaps or trenches were, however, missing in 28% of their farms. Most remarkable was the absence of any Interference risk analysis, i.e. a plan to avoid risks owing to the presence at the farm of external personnel, especially contractors for cereal or grape harvesting. Only 8.6% of farms had conducted a proper analysis of such risks. In approx. one half of the farms, a specific analysis was made to assess the main features of the tractors (Table 5). The average nominal power was 63 kW, and the average age was 20.9 years. The average annual usage (328 h/year) was related with the small average land area (63.9 ha, Table 1), and was far from the level suggested for profitable management (at least 600 h/year).

These data offer some clues as to the current difficult economic situation in most of the farms: the reasons are many, which cannot be fully discussed here. Anyway, this makes even more difficult for these farms to bear the costs involved by current requirements for risk prevention and protection.

Table 3. Managers and services.

	Not present (% of farms)
Safety manager	17.2
Medical doctor	48.1
Fire prevention manager	33.3
First-aid manager	34.6
Workers' supervisor	63.0
Training and information service (workers)	38.3
Special training service (managers)	44.3

Table 4. Situation of buildings in the farm.

Building services	Yes (%)	No (%)
Toilets	93.9	6.1
Showers	87.2	12.7
Dressing room	86.4	13.5
Main entrance to farm > 5 m	81.3	18.6
Railing on hole, trench	71.8	28.1
Interference risk analysis	8.6	91.4

Table 5. Tractors at the farms.

	no. of tractors	Power (kW)	Age (years)	Usage (hours)	Usage (hours/year)
Dairy farms	54	76.6	20.7	7339	355
Other livestock	18	65.6	21.6	7078	328
Viticulture	62	57.1	15.3	4444	290
Horticulture and nursery	26	50.3	27.8	3610	130
Other	2	40.4	24.8	1750	71
Mixed	29	61.8	26.1	15329	588
Cereal crops	5	64.7	20.0	6958	348
All farms	196	63.1	20.9	6873	328

In fact, missing protection devices are mostly related to the tractor's old age. In most of the sample farms, tractors were equipped with roll over protection structures (ROPS), protection of moving parts such as belts and fans, and of hot surfaces (Table 6). Remarkably, however, a safety belt was missing at the driver's seat in 55.1% of the tractors (it is compulsory since 2005); PTO guards were also missing in 24.7% of the tractors.

Table 6. Protective devices.

Protective item	missing (% of tractors)
ROPS	5.2
Safety belt	55.1
Protection of belts & fans	7.6
Protection of hot surfaces	10.8
Safe access to driver seat	13.6
PTO guards	24.7
CE marking	37.6
Owner handbook	8.0

The relationship between the presence of protective items and the tractor's age is shown in Figure 2. All of the new tractors were in line with legal requirements; the only exception was a safe access to the driver's seat, which is often difficult to attain especially in small tractors for viticulture. This means that the main problem for these farms is the low investment capacity, that prevents them to replace old tractors with new ones.

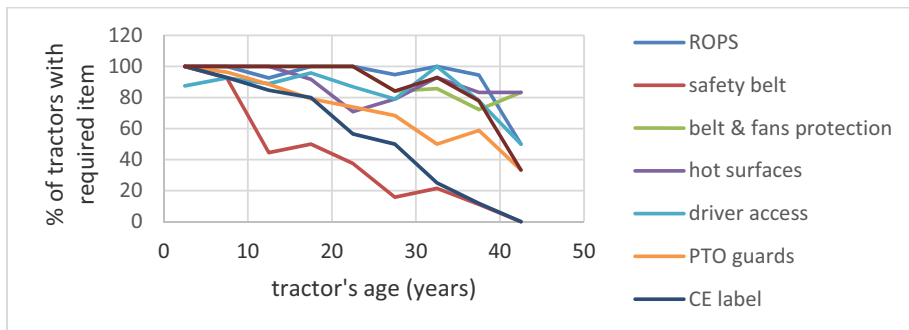


Fig. 2. Tractors with required protective items in place.

Figure 3 shows the percentages of farms that were providing their workers with personal protection equipment

(PPE). In general, only basic PPE were present (like overalls in cotton and mechanical protection gloves), while specific PPE were seldom found (such as ear muffs, safety footwear, chemical resistant clothing and gloves). The main findings from the survey suggested that many agricultural farms were sufficiently aware of the risks associated with their specific production systems, or with the machinery used, but had a tendency to neglect them to some extent, particularly in order to avoid the related economic costs. More important, information about legal obligations was generally insufficient, as was the understanding of the possible cost, in terms of fines, damage compensations and similar, that failure to comply with the rules might cause.

This suggested that most farms would take advantage of some simple informative tool, e.g. in the form of a software, in order to quickly detect the most critical situations. This software, based on a Microsoft Excel® worksheet (Figure 4), enables the farmer to check all the legal requirements for tractors and the main agricultural implements, and suggests how to amend possible defects. For example, it is possible to examine the existing ROPS on a tractor (Figure 5) and understand whether it fulfils legal requirements or needs changes or replacement; or, indications are given about how to install a ROPS on an old tractor.

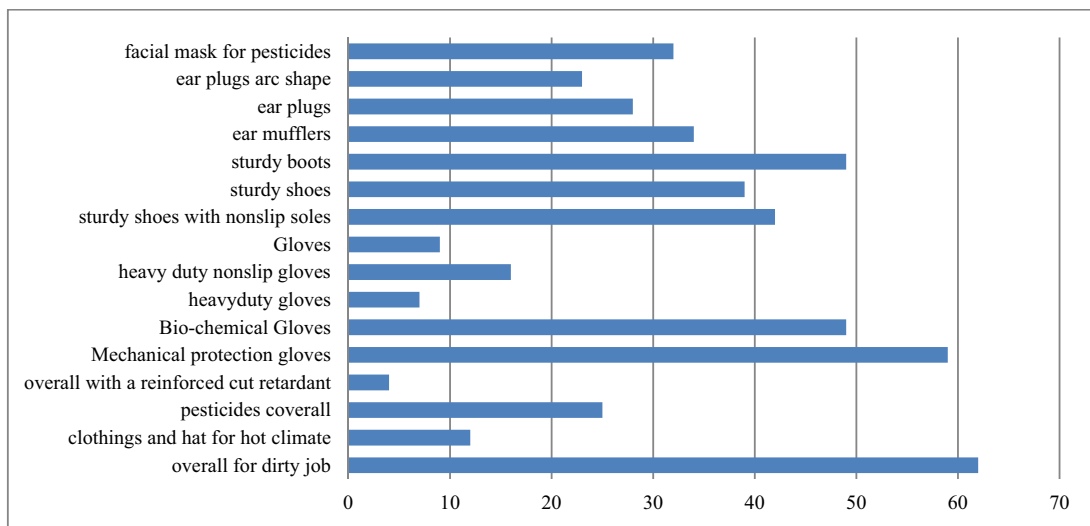


Fig. 3. Types of personal protective equipment (PPE) provided at the farms (% of farms where present).

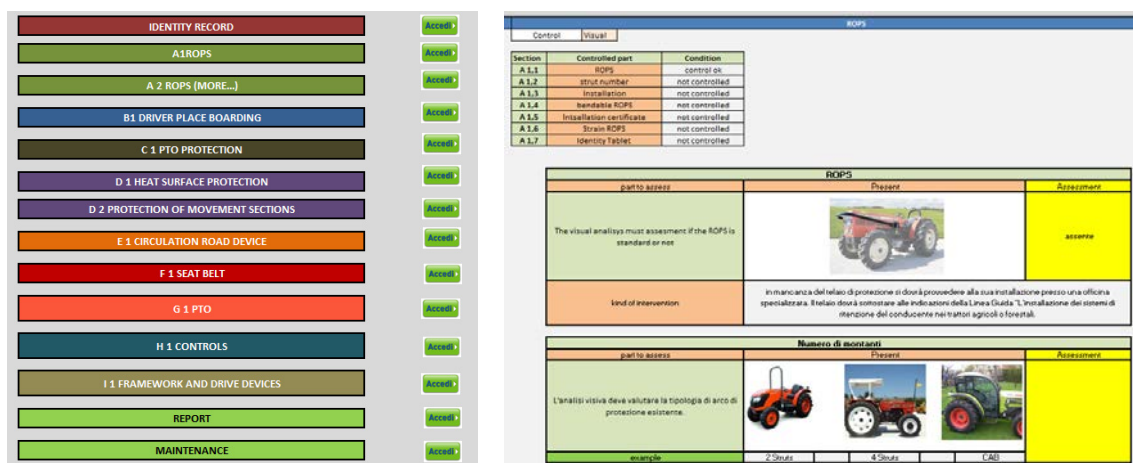


Fig. 4 - 5. Software menu for check safety device in the tractors (left) and menu section of tractor ROPS (right).

#### 4. Conclusions

The survey was important to improve current knowledge about work safety in agricultural farms, and was also useful to increase the farmer's awareness about the specific risks involved by the different production systems.

A further step will be to improve safety conditions through proper informative and self-assessment tools. Since the survey had shown that most of old tractors and machinery were defective in one way or another, we prepared a software to help the farmer check each machine and detect any improper or missing protective device, or to amend it in order to fulfil legal requirements.

Finally, this work was instrumental to building a data base about current situation of agricultural tractors and implements in use in the Region Friuli Venezia Giulia.

#### Acknowledgements

This work was supported by Inail (2012) De.me.trà: “Definizione di una Metodologia Ragionata per il miglioramento progressivo e sostenibile della sicurezza in Agricoltura”.

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