# Smart Machines, Remote Sensing, Precision Farming, Processes, Mechatronic, Materials and Policies for Safety and Health Aspects

**Andrea Colantoni** [1,*] , **Danilo Monarca** [1], **Vincenzo Laurendi** [2], **Mauro Villarini** [1] , **Filippo Gambella** [3] and **Massimo Cecchini** [1]

1. Department of Agricultural and Forestry Sciences (DAFNE), University of Tuscia, Via S. Camillo De Lellis, 1-01100 Viterbo, Italy; monarca@unitus.it (D.M.); mauro.villarini@unitus.it (M.V.); cecchini@unitus.it (M.C.)
2. National Institute for Insurance against Accidents at Work (INAIL), Via Fontana Candida, 1-00078 Monte Porzio Catone (RM), Italy; v.laurendi@inail.it
3. Department of Agriculture, University of Sassari, Viale Italia, 39-07100 Sassari, Italy; gambella@uniss.it
* Correspondence: colantoni@unitus.it; Tel.: +39-076-1357-356

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**Abstract:** The purpose of this Special Issue is to publish high-quality research papers, as well as review articles, addressing recent advances on systems, processes, and materials for work safety, health, and environment. Original, high-quality contributions that have not yet been published, or that are not currently under review by other journals or peer-reviewed conferences, have been sought. The main topics have been the protection system aimed to agricultural health and safety especially applied to mechanization sector (harvester, chippers), often involved in accidents at work, in the context of Directive 2006/42/EC, and to other families of risk as the chemical one and issues pertinent to safety. Methodologies for gradual and sustainable safety improvements on farms have been investigated in the vision of preliminary applications. Furthermore, the application of technologies aimed to the improvement and facilitation of operations in the agriculture sector as monitoring, precision farming, internet of things, application of evolved networks and machines of new conception.

**Keywords:** Agriculture Engineering; mechatronic; sensors; safety engineering; precision farming

## 1. Introduction

The introduction of "smart machines" for agricultural operations will allow several advantages, such as an increase in their efficiencies, a reduction in environmental impacts and a reduction of work injuries. There are partially- and fully-automatic devices for most aspects of agricultural functions, from seeding and planting to harvesting and post harvesting, from spraying to livestock management, and so on [1–5]. Moreover "precision farming", using sensors and robotic technologies are applied to existing systems. Work health and safety are also linked to the use of modern technologies, e.g., the protection of machinery operators from crush, entanglement, and shearing by means of mechatronic solutions [6–8]. Another aspect is the use of robots and smart automation, which can also benefit from the gathering of operational data, such as machine condition and fleet monitoring, allowing preventive maintenance and improved fleet management [9]. Considerable advances in sensing hardware, information technologies, smart systems, and software algorithms, have led to significant new developments in the areas of equipment health monitoring, fault diagnosis, and prognosis. These advances enable industries to undergo a fundamental shift towards condition- based maintenance to improve equipment availability and readiness at reduced operating costs throughout the system life-cycle [10–12].

The emergence of sensor networks is also bringing the possibility of collective learning algorithms and decision-theoretic approaches to facilitate effective and scalable diagnostic/prognostic technology for widespread deployment of condition-based maintenance [9]. The mentioned technological development is applicable to the relevant context of safety engineering [13–16]. Furthermore, energy, safety and agriculture have an important role in reducing environmental emissions [17–20]. All the systems aimed at the management of energy, safety and environment are performed and optimized by means of innovative technologies, materials, processes, and methods [21–32].

The purpose of this Special Issue is to publish high-quality research papers, as well as review articles, addressing recent advances on systems, processes, and materials for work safety, health, and environment.

The objectives of this special issue are:

- study of man–machine dialogue systems;
- analysis on towed or carried machines: forestry chippers, manure spreaders, round balers and others;
- safety and health management system design and engineering;
- safety and health monitoring sensors and sensing;
- data-driven methods for anomaly detection, diagnosis and prognosis;
- precision farming;
- mechatronic;
- automotive and agriculture machinery applications;
- engineering of hybrid and integrated systems and their efficiency maximization, especially for safety and health purposes, aimed to injuries and accidents reduction;
- use of remote sensor and mechatronic systems applied in several aspects.

## 2. Papers in this Special Issue

The special issue "Smart machines, Remote Sensing, Precision Farming, Processes, Mechatronic, Materials and Policies for Safety and Health Aspects" brings together some of the latest research results in the field of smart machines connected with the safety and health aspects. It presents eighteen papers, which deal with a wide range of research activities.

We can divide the special issue in three parts, as follow.

### 2.1. Research Articles

The first contribution in this section explores the "Agricultural Health and Safety Survey in Friuli Venezia Giulia" by Sirio Rossano Secondo Cividino, Gianfranco Pergher, Nicola Zucchiatti and Rino Gubiani [33]. The work in the agricultural sector has taken on a fundamental role in the last decades, due to the still too high rate of fatal injuries, workplace accidents, and dangerous occurrences reported each year [34]. The average old age of agricultural machinery is one of the main issues at stake in Italy. Numerous safety problems stem from that; therefore, two surveys were conducted in two different periods, on current levels of work safety in agriculture in relation to agricultural machinery's age and efficiency, and to show the levels of actual implementation of the Italian legislation on safety and health at work in the agricultural sector [34,35]. The surveys were carried out, considering a sample of 161 farms located in the region Friuli Venezia Giulia (North-East of Italy). The research highlights the most significant difficulties the sample of farms considered have in enforcing the law. One hand, sanitary surveillance and workers' information and training represent the main deficiencies and weakest points in family farms. Moreover, family farms do not generally provide the proper documentation concerning health and safety at workplaces, when they award the contract to other companies. On the other hand, lack of maintenance program for machinery and equipment, and of emergency plans and participation of workers' health and safety representative, are the most common issues in farms with employees. Several difficulties are also evident in planning workers' training

programs. Furthermore, the company physician's task is often limited to medical controls, so that he is not involved in risk assessment and training. Interviews in heterogeneous samples of farms have shown meaningful outcomes, which have subsequently been used to implement new databases and guidelines for Health and Safety Experts and courses in the field of Work Safety in agriculture. In conclusion, although the legislation making training courses for tractor operators and tractor inspections compulsory dates back to the years 2012 and 2015, deadlines have been prorogued, and the law is not yet fully applied, so that non-upgraded unfit old agricultural machinery is still being used by many workers, putting their health and their own lives at risk.

The second paper concerns the "Definition of a Methodology for Gradual and Sustainable Safety Improvements on Farms and Its Preliminary Applications" by Sirio Rossano Secondo Cividino, Gianfranco Pergher, Rino Gubiani, Carlo Moreschi, Ugo Da Broi, Michela Vello and Fabiano Rinaldi [36]. In many productive sectors, ensuring a safe working environment is still an underestimated problem and, especially, so in farming. A lack of attention to safety and poor risk awareness by operators represents a crucial problem, which results in numerous serious injuries and fatal accidents. The Demetra project, involving the collaboration of the Regional Directorate of INAIL (National Institute for Insurance against Accidents at Work), aims to devise operational solutions to evaluate the risk of accidents in agricultural work and analyze the dynamics of occupational accidents by using an observational method to help farmers ensure optimal safety levels. The challenge of the project is to support farmers with tools designed to encourage good safety management in the agricultural workplaces.

The third contribution is "Analysis of the Almond Harvesting and Hulling Mechanization Process: A Case Study" by Simone Pascuzzi and Francesco Santoro. The aim of this paper is the analysis of the almond harvesting system with a very high level of mechanization frequently used in Apulia for the almond harvesting and hulling process. Several tests were carried out to assess the technical aspects related to the machinery and to the mechanized harvesting system used itself, highlighting their usefulness, limits, and compatibility within the almond cultivation sector. Almonds were very easily separated from the tree, and this circumstance considerably improved the mechanical harvesting operation efficiency even if the total time was mainly affected by the time required to manoeuvre the machine and by the following manual tree beating. The mechanical pick-up from the ground was not effective, with only 30% of the dropped almond collected, which mainly was caused by both the pick-up reel of the machine being unable to approach the almonds dropped near the base of the trunk and the surface condition of the soil being unsuitably arranged for a mechanized pick-up operation. The work times concerning the hulling and screening processes, carried out at the farm, were heavily affected by several manual operations before, during, and after the executed process; nevertheless, the plant work capability varied from 170 to 200 kg/h with two operators.

The fourth paper entitled "Safety Improvements on Wood Chippers Currently in Use: A Study on Feasibility in the Italian Context" by Giorgia Bagagiolo, Vincenzo Laurendi and Eugenio Cavallo, following formal opposition by France on the harmonized safety standards regarding manually-loaded wood chippers (EN 13525:2005+A2:2009) which presumed compliance with the Essential Health and Safety Requirements (EHSR) required by the Machine Directive (Directive 2006/42/EC), have recently been withdrawn, and a new draft of the standard is currently under revision. In order to assess the potential impact of the expected future harmonized standards within the Italian context, this study has examined the main issues in implementing EHSRs on wood chippers already being used. Safety issues regarding wood chippers already in use were identified in an analysis of the draft standard, through the observation of a number of case studies, and qualitative analysis of the essential technical interventions. A number of agricultural and forestry operators and companies participated in the study, pointing out the technical and economic obstacle facing the safety features requested by the pending new standard. It emerged that the main safety issues concerned the implementation of the reverse function, the stop bar, and the protective devices, the infeed chute dimension, the emergency stop function, and the designated feeding area. The possibility of adopting such solutions mainly

depends on technical feasibility and costs, but an important role is also played by the attitude towards safety and a lack of adequate information regarding safety obligations and procedures among users.

The fifth paper concerns "Phytotoxicity and Chemical Characterization of Compost Derived from Pig Slurry Solid Fraction for Organic Pellet Production" by Niccolò Pampuro, Carlo Bisaglia, Elio Romano, Massimo Brambilla, Ester Foppa Pedretti and Eugenio Cavallo. The phytotoxicity of four different composts obtained from pig slurry solid fraction composted by itself (SSFC) and mixed with sawdust (SC), woodchips (WCC) and wheat straw (WSC) was tested with bioassay methods. For each compost type, the effect of water extracts of compost on seed germination and primary root growth of cress (*Lepidium Sativum* L.) was investigated. Composts were also chemically analysed for total nitrogen, ammonium, electrical conductivity and heavy metal (Cu and Zn). The chemicals were correlated to phytotoxicity indices. The mean values of the germination index (GI) obtained were 160.7, 187.9, 200.9 and 264.4 for WSC, WCC, SC and SSFC, respectively. Growth index (GrI) ranged from the 229.4%, the highest value, for SSFC, followed by 201.9% for SC, and 193.1% for WCC, to the lowest value, 121.4%, for WSC. Electrical conductivity showed a significant and negative correlation with relative seed germination at the 50% and 75% concentrations. A strong positive correlation was found for water-extractable Cu with relative root growth and germination index at the 10% concentration. Water-extractable Zn showed a significant positive correlation with relative root growth and GI at the 10% concentration. These results highlighted that the four composts could be used for organic pellet production and subsequently distributed as a soil amendment with positive effects on seed germination and plant growth (GI > 80%).

The sixth paper illustrated "A Study of the Lateral Stability of Self-Propelled Fruit Harvesters" by Maurizio Cutini, Massimo Brambilla, Carlo Bisaglia, Stefano Melzi, Edoardo Sabbioni, Michele Vignati, Eugenio Cavallo and Vincenzo Laurendi. Self-propelled fruit harvesters (SPFHs) are agricultural machines designed to facilitate fruit picking and other tasks requiring operators to stay close to the foliage or to the upper part of the canopy. They generally consist of a chassis with a variable height working platform that can be equipped with lateral extending platforms. The positioning of additional masses (operators, fruit bins) and the maximum height of the platform (up to three meters above the ground) strongly affect machine stability. Since there are no specific studies on the lateral stability of SPFHs, this study aimed to develop a specific test procedure to fill this gap. A survey of the Italian market found 20 firms manufacturing 110 different models of vehicles. Observation and monitoring of SPFHs under real operational conditions revealed the variables mostly likely to affect lateral stability: the position and mass of the operators and the fruit bin on the platform. Two SPFHs were tested in the laboratory to determine their centre of gravity and lateral stability in four different settings reproducing operational conditions. The test setting was found to affect the stability angle. Lastly, the study identified two specific settings reproducing real operational conditions most likely to affect the lateral stability of SPFHs: these should be used as standard, reproducible settings to enable a comparison of results.

The seventh article entitled "Development of a Variable Rate Chemical Sprayer for Monitoring Diseases and Pests Infestation in Coconut Plantations" by Grianggai Samseemoung, Peeyush Soni and Pimsiri Suwan shows an image processing-based variable rate chemical sprayer for disease and pest-infested coconut plantations was designed and evaluated. The manual application of chemicals is considered risky and hazardous to workers, and provides low precision. The designed sprayer consisted of a sprayer frame, motors, a power system, a chemical tank and pump, a crane, a nozzle with a remote monitoring system, and motion and crane controlling systems. As the target was confirmed, the nozzle was moved towards the target area (tree canopy) using the remote monitoring system. The pump then sprayed chemicals to the target at a specified rate. The results suggested optimal design values for 5–9 m tall coconut trees, including the distance between nozzle and target (1 m), pressure (1.5 bar), spraying rate (2.712 L/min), the highest movement speed (1.5 km/h), fuel consumption (0.58 L/h), and working capacity (0.056 ha/h). The sprayer reduced labor requirements, prevented chemical hazards to workers, and increased coconut pest controlling efficiency.

The eighth article is: "Analysis of the almond harvesting and hulling mechanization process". A case study by Simone Pascuzzi e Francesco Santoro, the aim of this paper is the analysis of the almond harvesting system with a very high level of mechanization frequently used in Apulia (Southern Italy). It is the leading Italian region for the production of olive oil ($115 \times 10^6$ kg of oil/year), and the olive oil chain is really important from a business point of view. Currently, the extraction of olive oil is essentially performed by using a mechanical pressing process (traditional olive oil mills), or by the centrifugation process (modern olive oil mills). The aim of this paper is to evaluate in detail the noise levels within a typical olive oil mill located in the northern part of the Apulia region during olive oil extraction. The feasibility of this study focusing on the assessment of workers' exposure to noise was tested in compliance with the Italian-European Regulations and US standards and criteria. Several measurements of the noise emission produced by each machine belonging to the productive cycle were carried out during olive oil production. The results obtained were then used to evaluate possible improvements to carry out in order to achieve better working conditions. An effective reduction in noise could probably be achieved through a combination of different solutions, which obviously have to be assessed not only from a technical point of view but also an economic one. A significant reduction in noise levels could be achieved by increasing the area of the room allotted to the olive oil extraction cycle by removing all the unnecessary partition walls that might be present.

The ninth paper regards the "Monitoring and Precision Spraying for Orchid Plantation with Wireless WebCAMs" by Grianggai Samseemoung, Peeyush Soni and Chaiyan Sirikul, face up the processing images taken from wireless WebCAMs on the low altitude remote sensing (LARS) platform, this research monitored crop growth, pest, and disease information in a dendrobium orchid's plantation. Vegetetative indices were derived for distinguishing different stages of crop growth, and the infestation density of pests and diseases. Image data was processed through an algorithm created in MATLAB® (The MathWorks, Inc., Natick, MA, USA). Corresponding to the orchid's growth stage and its infestation density, varying levels of fertilizer and chemical injections were administered. The acquired LARS images from wireless WebCAMs were positioned using geo-referencing, and eventually processed to estimate vegetative-indices (Red = 650 nm and NIR = 800 nm band center). Good correlations and a clear cluster range were obtained in characteristic plots of the normalized difference vegetation index (NDVI) and the green normalized difference vegetation index (GNDVI) against chlorophyll content. The coefficient of determination, the chlorophyll content values ($\mu$mol m$^{-2}$) showed significant differences among clusters for healthy orchids ($R^2$ = 0.985–0.992), and for infested orchids ($R^2$ = 0.984–0.998). The WebCAM application, while being inexpensive, provided acceptable inputs for image processing. The LARS platform gave its best performance at an altitude of 1.2 m above canopy. The image processing software based on LARS images provided satisfactory results as compared with manual measurements.

The tenth paper is "Energy and Carbon Impact of Precision Livestock Farming Technologies Implementation in the Milk Chain: From Dairy Farm to Cheese Factory" by Giuseppe Todde, Maria Caria, Filippo Gambella and Antonio Pazzona speak of Precision Livestock Farming (PLF) is being developed in livestock farms to relieve the human workload and to help farmers to optimize production and management procedure. The objectives of this study were to evaluate the consequences in energy intensity and the related carbon impact, from dairy farm to cheese factory, due to the implementation of a real-time milk analysis and separation (AfiMilk MCS) in milking parlors. The research carried out involved three conventional dairy farms, the collection and delivery of milk from dairy farms to cheese factory and the processing line of a traditional soft cheese into a dairy factory. The AfiMilk MCS system installed in the milking parlors allowed to obtain a large number of information related to the quantity and quality of milk from each individual cow and to separate milk with two different composition (one with high coagulation properties and the other one with low coagulation properties), with different percentage of separation. Due to the presence of an additional milkline and the AfiMilk MCS components, the energy requirements and the related environmental impact at farm level were slightly higher, among 1.1% and 4.4%. The logistic of milk collection was also significantly reorganized in view of the collection of two separate type of milk, hence, it leads an increment of 44% of the energy

requirements. The logistic of milk collection and delivery represents the process which the highest incidence in energy consumption occurred after the installation of the PLF technology. Thanks to the availability of milk with high coagulation properties, the dairy plant, produced traditional soft cheese avoiding the standardization of the formula, as a result, the energy uses decreased about 44%, while considering the whole chain, the emissions of carbon dioxide was reduced by 69%. In this study, the application of advance technologies in milking parlors modified not only the on-farm management but mainly the procedure carried out in cheese making plant. This aspect makes precision livestock farming implementation unimportant technology that may provide important benefits throughout the overall milk chain, avoiding about 2.65 MJ of primary energy every 100 kg of processed milk.

The eleventh papers is "Adoption of Web-Based Spatial Tools by Agricultural Producers: Conversations with Seven Northeastern Ontario Farmers Using the GeoVisage Decision Support System" by Daniel H. Jarvis, Mark P. Wachowiak, Dan F. Walters and John M. Kovacs. The paper reports the findings of a multi-site qualitative case study research project designed to document the utility and perceived usefulness of weather station and imagery data associated with the online resource GeoVisage among northeastern Ontario farmers. Interviews were conducted onsite at five participating farms (three dairy, one cash crop, and one public access fruit/vegetable) in 2014–2016, and these conversations were transcribed and returned to participants for member checking. Interview data was then entered into Atlas.ti software for the purpose of qualitative thematic analysis. Fifteen codes emerged from the data and findings center around three overarching themes: common uses of weather station data (e.g., air/soil temperature, rainfall); the use of GeoVisage Imagery data/tools (e.g., acreage calculations, remotely sensed imagery); and future recommendations for the online resource (e.g., communication, secure crop imagery, mobile access). Overall, weather station data and tools freely accessible through the GeoVisage site were viewed as representing a timely, positive, and important addition to contemporary agricultural decision-making in northeastern Ontario farming.

The twelfth article is "Safety-Critical Manuals for Agricultural Tractor Drivers: A Method to Improve Their Usability" by Maurizio Cutini, Giada Forte, Marco Maietta, Maurizio Mazzenga, Simon Mastrangelo and Carlo Bisaglia. This work sets out the planning phases adopted for the first time to put together a manual on injury and accident prevention in the use of farm tractors. The goal is to convey information more effectively than at present, while taking the end users' opinions into consideration. The manual was devised, created, and tested based on a human-centred design (HCD) process, which identified the operators' requirements using a participatory ergonomics (PE) strategy. The main topics of the manual were outlined by engaging the users in a qualitative research activity (i.e., focus groups and workshops with final users), and the contents were prioritized and labelled by way of a noun prioritization activity. The users were involved right up to the choice of graphics and print layout in order to orient the publication to the farming context. The research activity highlighted a divergence between the operators' requirements and the topics currently dealt with in the sector publications. The project resulted in the publication of the "Safe Tractor" manual, which features some innovations. The experience highlighted the need to adopt HCD processes to create innovative editorial products, which can help speed up the dissemination of safety culture in the primary sector.

The thirteenth paper face up the "Precision Farming in Hilly Areas: The Use of Network RTK in GNSS Technology" by Alvaro Marucci, Andrea Colantoni, Ilaria Zambon and Gianluca Egidi [37]. The number of GNSS satellites has greatly increased over the last few decades, which has led to increased interest in developing self-propelled vehicles. Even agricultural vehicles have a great potential for use of these systems. In fact, it is possible to improve the efficiency of machines in terms of their working uniformity, reduction of fertilizers, pesticides, etc. with the aim of (i) reducing the timeframes of cultivation operations with significant economic benefits and, above all; (ii) decreasing environmental impact. These systems face some perplexity in hilly environments but, with specific devices, it is possible to overcome any signal deficiencies. In hilly areas then, the satellite-based system can also be used to safeguard operators' safety from the risk of rollover. This paper reports the

results obtained from a rural development program (RDP) in the Lazio Region 2007/2013 (measure project 1.2.4) for the introduction and diffusion of GNSS satellites systems in hilly areas.

The fourteenth article is "Identification of Optimal Mechanization Processes for Harvesting Hazelnuts Based on Geospatial Technologies in Sicily (Southern Italy)" by Ilaria Zambon, Lavinia Delfanti, Alvaro Marucci, Roberto Bedini, Walter Bessone, Massimo Cecchini and Danilo Monarca [38]. Sicily is a region located in the southern Italy. The typical Mediterranean landscape can be appreciated due to its high biodiversity [39–49]. Specifically in Sicily, hazelnut plantations have adapted in a definite area in Sicily (the Nebrodi Park, Sant'Agata Militello, Messina, Italy) due to specific morphological and climatic characteristics. However, many of these plantations are not used today due to adverse conditions, both to collect hazelnuts and to reach hazel groves. Though a geospatial analysis, the paper aims to identify which hazelnut contexts can be actively used for agricultural, economic (e.g., introduction of a circular economy) and energetic purposes (to establish a potential agro-energetic district) [40,42]. The examination revealed the most suitable areas giving several criteria (e.g., slope, road system), ensuring an effective cultivation and consequent harvesting of hazelnuts and providing security for the operators since many of hazelnut plants are placed in very sloped contexts that are difficult to reach by traditional machines. In this sense, this paper also suggests optimal mechanization processes for harvesting hazelnuts in this part of Sicily.

## 2.2. Review Articles

The first review is "Analysis of the Cause-Effect Relation between Tractor Overturns and Traumatic Lesions Suffered by Drivers and Passengers: A Crucial Step in the Reconstruction of Accident Dynamics and the Improvement of Prevention" by Carlo Moreschi, Ugo Da Broi, Sirio Rossano Secondo Cividino, Rino Gubiani, Gianfranco Pergher, Michela Vello and Fabiano Rinaldi. The evaluation of the dynamics of accidents involving the overturning of farm tractors is difficult for both engineers and coroners. A clear reconstruction of the causes, vectorial forces, speed, acceleration, timing and direction of rear, front and side rollovers may be complicated by the complexity of the lesions, the absence of witnesses and the death of the operator, and sometimes also by multiple overturns. Careful analysis of the death scene, vehicle, traumatic lesions and their comparison with the mechanical structures of the vehicle and the morphology of the terrain, should help experts to reconstruct the dynamics of accidents and may help in the design of new preventive equipment and procedures.

The second review is "Whole-Body Vibration in Farming: Background Document for Creating a Simplified Procedure to Determine Agricultural Tractor Vibration Comfort" by Maurizio Cutini, Massimo Brambilla and Carlo Bisaglia. The operator exposure to high levels of whole-body vibration (WBV) presents risks to health and safety and it is reported to worsen or even cause back injuries. Work activities resulting in operator exposure to whole-body vibration have a common onset in off-road work such as farming. Despite the wide variability of agricultural surface profiles, studies have shown that with changing soil profile and tractor speed, the accelerations resulting from ground input present similar spectral trends. While on the one hand such studies confirmed that tractor WBV emission levels are very dependent upon the nature of the operation performed, on the other, irrespective of the wide range of conditions characterizing agricultural operations, they led researchers to set up a possible and realistic simplification and standardization of tractor driver comfort testing activities. The studies indicate the usefulness, and the possibility, of developing simplified procedures to determine agricultural tractor vibration comfort. The results obtained could be used effectively to compare tractors of the same category or a given tractor when equipped with different seats, suspension, tyres, etc.

## 2.3. Technical Note

The first technical note is "Mechatronic Solutions for the Safety of Workers Involved in the Use of Manure Spreader" by Massimo Cecchini, Danilo Monarca, Vincenzo Laurendi, Daniele Puri and Filippo Cossio [50]. An internationally acknowledged requirement is to analyze and provide technical

solutions for prevention and safety during the use and maintenance of manure spreader wagons. Injuries statistics data and specific studies show that particular constructive criticalities have been identified on these machines, which are the cause of serious and often fatal accidents. These accidents particularly occur during the washing and maintenance phases, especially when such practices are carried out inside the hopper when the rotating parts of the machine are in action. The current technical standards and the various safety requirements under consideration have not always been effective for protecting workers. To this end, the use of SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats) allowed authors to highlight critical and positive aspects of the different solutions studied for reducing the risk due to contact with the rotating parts. The selected and tested solution consists of a decoupling system automatically activated when the wheels of the wagon are not moving. Such a solution prevents the contact with the moving rotating parts of the machine when the worker is inside the hopper. This mechatronic solution allowed to obtain a prototype that has led to the resolution of the issues related to the use of the wagon itself: in fact, the system guarantees the stopping of manure spreading organs in about 12 s from the moment of the wheels stopping [50].

The second technical note is "Innovative Solution for Reducing the Run-Down Time of the Chipper Disc Using a Brake Clamp Device" by Andrea Colantoni, Francesco Mazzocchi, Vincenzo Laurendi, Stefano Grigolato, Francesca Monarca, Danilo Monarca and Massimo Cecchini [51]. Wood-chippers are widely used machines in the forestry, urban and agricultural sectors. The use of these machines implies various risks for workers, primarily the risk of contact with moving and cutting parts. These machine parts have a high moment of inertia that can lead to entrainment with the cutting components. This risk is particularly high in the case of manually fed chippers. Following cases of injury with wood-chippers and the improvement of the technical standard (Comité Européen de Normalisation-European Norm) EN 13525:2005+A2:2009, the technical note presents the prototype of an innovative system to reduce risks related to the involved moving parts, based on the "brake caliper" system and electromagnetic clutch for the declutching of the power take-off (PTO). The prototype has demonstrated its potential for reducing the run-down time of the chipper disc (95%) and for reducing the worker's risk of entanglement and entrainment in the machine's feed mouth.

## 3. Conclusions

In summary, the papers of the special issue represent some of the latest and most promising research results in this new and exciting field, which continues to make significant impact on real-world applications. We are confident that this special issue will stimulate further research in this area.

**Conflicts of Interest:** The authors declare no conflicts of interest.

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