



RESEARCH ARTICLE

A Study on Occupational Health and Safety in the Agricultural Sector in Türkiye: Analysis of Work Accidents, Occupational Diseases, and Lost Workdays

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ABSTRACT

The agricultural sector holds strategic economic importance due to its roles in food production, employment, and providing raw materials to industry. Türkiye is a significant agricultural country with its biological diversity, favourable climate conditions, and agriculture-based sector. According to the labor force statistics of the Turkish Statistical Institute (TÜİK), as of 2023, approximately 4.7 million people are employed in the agricultural sector in Türkiye, with the majority being seasonal workers. The farm sector includes field farming, livestock, fisheries, and forestry. Occupational Health and Safety (OHS) is vital for the sustainability of the agricultural sector. The Occupational Health and Safety Law No. 6331, which came into force in 2012, has mandated OHS provisions for all enterprises and employees in the agricultural sector. This study examines the statistics on work accidents, occupational diseases, and lost workdays in Türkiye's plant and animal production sector between 2018 and 2022 and evaluates the current state of OHS practices. Based on data from the Social Security Institution (SGK), the analysis reveals that 13,993 work accidents and 96 fatal work accidents occurred in the plant and animal production sector between 2018 and 2022, with the highest frequency of work accidents recorded in 2022. Additionally, 13 cases of occupational diseases were reported during the same period. An examination of temporary incapacity durations shows 133,008 days of incapacity reports, with the highest number occurring in 2021, influenced by the COVID-19 pandemic. The study's findings indicate that OHS practices in the agricultural sector are inadequate and need improvement. In light of these findings, various policy recommendations have been developed, such as the widespread implementation of OHS training, increased health screenings, and stricter OHS inspections.



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1. Introduction

The agricultural sector holds strategic importance in national economies because it meets food needs, contributes to national income and employment, and provides raw materials for agriculture-based industries (Demir, 2015). With its biological diversity, rich climate and geographical conditions, presence of agriculture-based industries, and ranking in the top

ten globally for producing fifty-five products, Türkiye is among the world's significant agricultural countries (Solmaz, 2023). According to 2023 employment data from the Turkish Statistical Institute (TÜİK), approximately 4.7 million people aged 15 and over work in the agricultural sector, with 2.7 million being male workers and 2 million female workers, the majority of whom are seasonal workers (TÜİK, 2023).

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When referring to the agricultural sector, it is essential to remember that it includes not only field farming with branches such as grain cultivation, vegetable growing, greenhouse farming, fruit growing, and seedling cultivation but also livestock breeding, including types such as large and small animal husbandry, dairy farming, and poultry farming; fishing, including marine and lake fishing, fish farming in ponds and farms; and forestry-logging (Suvla, 1949).

The sustainability of the agricultural sector is possible by ensuring the health and safety of agricultural workers. Regarding economy and employment, occupational health and safety in the agricultural sector are of indispensable importance. Until June 30, 2012, the occupational health and safety provisions of Labor Law No. 4857 were only applied to agricultural enterprises employing more than 50 workers, exempting those with fewer than 50 workers. However, with the publication of the Occupational Health and Safety Law No. 6331 on this date, the provisions of this law were applied to all enterprises and workers (Engin, 2014). In addition, agricultural activities were generally located in "Hazardous" occupational zones according to the Workplace Hazard Classes Communiqué published in the Official Gazette dated 27.2.2017 and numbered 29992.

Occupational health and safety in the agricultural sector are vital to meet workers' basic needs, ensure suitable working and living conditions, protect their health and welfare, and increase labour productivity. Agricultural workers face a series of potential occupational health and safety risks, including physical, chemical, biological, ergonomic, and psychosocial risks. These risks can lead to work accidents and occupational diseases, endangering the health and safety of workers. The health and safety problems faced by agricultural workers largely resemble those of industrial workers (Bakırcı, 2011; Engin, 2014; Seyhan & Seyhan, 2015; Yalçın et al., 2016).

Common or potentially developing diseases, injuries, and accidents among agricultural workers include severe mechanical risks such as death or limb loss related to the use of vehicles, tools, tractors, and agricultural machinery; cancers; respiratory diseases; skin disorders; animal-related accidents and diseases; exposure to pesticides and other chemicals; dust exposure; contact with hazardous plants and biological substances; infectious and parasitic diseases; noise exposure and hearing loss; vibration exposure and its effects; ergonomic problems such as heavy lifting and repetitive movements, leading to musculoskeletal disorders; working in adverse climatic conditions like extreme heat or cold, leading to thermal risks; and psychosocial factors and stress. Causes of fatal work accidents in the agricultural sector include transportation (being run over by tractors or agricultural machinery, or vehicle overturning), falls from height, being hit by moving or falling objects, drowning, livestock-related accidents, machinery-related accidents, and electrical accidents (Bakırcı, 2011; Engin, 2014; Seyhan & Seyhan, 2015; Yalçın et al., 2016).

Previous research on occupational health and safety (OHS) in the agricultural sector reveals that workers in this field face significant physical, chemical, biological, ergonomic, and psychosocial risks (Bakırcı, 2011; Engin, 2014). In Türkiye, these risks are further intensified due to the high rates of seasonal and informal employment in the agricultural sector. For instance, Demir (2015) notes that seasonal agricultural workers in Türkiye experience significant challenges in accessing social security rights. Yalçın et al. (2016) identified machinery-related accidents, pesticide exposure, and extreme weather conditions as primary causes of occupational accidents in agriculture. Although the Occupational Health and Safety Law No. 6331, enacted in 2012, aimed to extend OHS protection across all sectors, the unique structural issues of the sector, such as seasonal labor and informal employment, have posed various challenges to implementing this law in agriculture (Gülçubuk, 2017).

This study aims to examine the statistics on work accidents, occupational diseases, and temporary and permanent workday losses in the "Plant and Animal Production Sector" in Türkiye over the five years from 2018 to 2022 and to contribute to the policies to be produced on occupational health and safety by making some recommendations based on the data obtained from these statistics.

While occupational health and safety (OHS) in agriculture has been explored in previous studies, there remains a significant gap in the literature regarding comprehensive, up-to-date statistical analysis specific to Türkiye's plant and animal production sectors. Most existing research focuses broadly on OHS risks without providing detailed temporal data on work accidents, occupational diseases, and lost workdays across multiple years. This study fills that gap by offering an in-depth analysis of recent OHS data from 2018 to 2022, which includes year-over-year comparisons that highlight trends and emerging risks specific to Türkiye's agricultural sector. The originality of this research lies in its focus on quantifying and examining OHS incidents in a sector marked by high rates of informal and seasonal employment, which presents unique challenges. By identifying specific risk factors and trends within the agricultural sector, this study contributes actionable insights to policymakers, aiming to improve safety regulations and reduce work-related accidents and diseases in agriculture. Furthermore, the study's findings provide a foundation for future research on effective OHS policies tailored to the needs of Türkiye's agricultural workforce.

This article is structured as follows: The introduction section provides general information about the agricultural sector in Turkey, its workers and occupational health and safety risks in the sector. The materials and methods section describes in detail the materials and methods outlining the data sources and statistical approaches used to analyze occupational accidents, occupational diseases and lost work days in the

agricultural sector in Turkey. The results and discussion section presents the results of this analysis, including trends in accident frequency, mortality rates, occupational disease incidence and temporary disability days in different years. The section also places these findings in the context of occupational health and safety (OHS) practices, compares them with international standards and identifies critical gaps in current practices. Finally, the conclusion section concludes with policy recommendations aimed at improving OSH in the agricultural sector in Turkey, including the need for enhanced safety protocols, regular health screenings and improved training programs for agricultural workers.

2. Materials and Methods

According to the Social Insurance and General Health Insurance Law No. 5510, work accidents and occupational diseases only cover insured individuals (Social Security and General Health Insurance Law, 2006). Therefore, this study utilised the annual statistics of the T.C. Social Security Institution (SGK) as the data source. The "statistics on work accidents and occupational diseases," "statistics on work incapacity periods," and "insured and workplace statistics" from the 2018-2022 period in the SGK annual statistics were examined. Attempts were made to analyse work accidents, occupational diseases, and work incapacity days for insured workers in Türkiye's Plant and Animal Production Sector. The statistical data used in this study were obtained according to the NACE Rev.2 classification. In the NACE classification, the main category is defined as 'Agriculture, forestry, hunting, and related service activities.' However, our study focuses specifically on the subcategory 'Crop and animal production.' The data used do not include statistics from the 'Hunting and related service activities' subcategory but instead cover only the statistics related to crop and animal production activities. Therefore, the OHS data analyzed in this study provide specific information related to the agriculture and livestock subsector. Due to the classification of employees as 4-a and 4-b under the Social Insurance and General Health Insurance Law No. 5510 after 2017, the five years from 2018 to 2022 include the total of these two groups. Definitions related to the concepts examined in this study are given below.

2.1. Work Accident

Accidents occurring under the following conditions are considered occupational accidents.

- a) Incidents occurring while the insured is at the workplace, causing immediate or later physical or mental harm to the insured,
- b) Incidents occurring outside the workplace while performing tasks or duties assigned by the employer, causing immediate or later physical or mental harm to the insured,

- c) Incidents occurring while the insured working for an employer is sent to another place outside the workplace for a task, causing immediate or later physical or mental harm to the insured when the main job is not being performed,

- d) Incidents occurring during the time allowed for breastfeeding by insured female workers, causing immediate or later physical or mental harm to the insured,

- e) Incidents occur while the insured is commuting to and from where the job is performed using a vehicle provided by the employer, causing immediate or later physical or mental harm to the insured (Social Security and General Health Insurance Law, 2006).

2.2. Work Accident Frequency Rate

Work Accident Frequency Rate (WAFR) indicates how many insured individuals out of every 100 who work full-time have experienced a work accident. The formula is as follows.

$$WAFR = IKS / (Total Working Hours) \times 225,000 \quad (1)$$

IKS represents the number of insured individuals who have experienced a work accident. In contrast, Total Working Hours represent 2,250 hours (considering a standard work year of 45 hours per week and 50 weeks per year for a full-time worker) and the total number of workers. The coefficient of 225,000 is calculated based on the assumption of 100 insured individuals working full-time for 45 hours per week and 50 weeks per year (Akyüz et al., 2016; Arıtan & Ataman, 2017).

2.3. Death Resulting from a Work Accident

According to the definition adopted by the European Statistics on Accidents at Work (ESAW) project, "fatal work accidents are accidents that cause the death of the insured worker within one year" (Erginel & Toptancı, 2017).

Occupational Disease refers to temporary or permanent diseases or physical or mental disabilities experienced by the insured due to repeated reasons related to the nature of the job or the conditions of its execution (Social Security and General Health Insurance Law, 2006).

Incapacity for Work refers to when the insured cannot work due to a work accident. Temporary incapacity for work represents the number of days the insured cannot work due to a work accident, occupational disease, illness, and maternity conditions, as indicated in the reports by doctors or health boards authorised by SGK. Permanent incapacity for work represents the number of insured individuals whose ability to earn a livelihood has decreased by at least 10% due to a work accident or occupational disease, as determined by health boards of healthcare providers authorised by SGK and confirmed by the SGK health board (Social Security and General Health Insurance Law, 2006).

Total Incapacity for Work Duration consists of the temporary incapacity period due to a work accident or

occupational disease, the days lost due to death from a work accident or occupational disease, and the days lost due to becoming permanently incapable of working.

3. Results and Discussion

In Türkiye, the total number of workplaces in the Plant and Animal Production Sector increased from 17,216 in 2018 to 19,802 in 2022, an increase of approximately 15%. The number of workplaces in the Plant and Animal Production Sector by year is shown in Table 1 (SGK, 2024).

Table 1. Number of workplaces in the plant and animal production sector by year.

Years	Permanent	Temporary	Public	Private	Total
2022	19,508	294	820	18,982	19,802
2021	18,575	292	799	18,068	18,867
2020	17,638	288	800	17,126	17,926
2019	16,911	282	635	16,558	17,193
2018	16,863	353	740	16,476	17,216

In parallel with this increase in the number of workplaces in the Plant and Animal Production Sector, the total number of insured workers increased from 103,608 in 2018, with 32,659 being female workers and 70,949 being male workers, to 123,990 in 2022, with 42,979 being female workers and 81,011

being male workers. Over the five years, workers increased by approximately 19.6%. The number of workers in the Plant and Animal Production Sector by year is shown in Table 2 (SGK, 2018, 2019, 2020, 2021, 2022).

Table 2. Number of employees in the plant and animal production sector by year.

Years	Permanent	Temporary	Public	Private	Male	Female	Total
2022	118,617	5,373	11,937	112,053	81,011	42,979	123,990
2021	111,606	4,297	10,673	105,230	76,529	39,374	115,903
2020	108,417	4,996	10,709	102,704	75,363	38,050	113,413
2019	101,278	3,591	8,564	96,305	71,925	32,944	104,869
2018	98,691	4,917	9,887	93,721	70,949	32,659	103,608

In the Plant and Animal Production Sector, 13,993 work accidents occurred over the five-year period from 2018 to 2022, 96 of which were fatal. The highest number of work accidents during this period was recorded in 2022, with 3,114 work accidents, 19 of which resulted in death. The number of work and fatal work accidents by year in the Plant and Animal Production Sector is shown in Table 3 (SGK, 2018, 2019, 2020, 2021, 2022).

Table 3. Number of employees involved in work accidents and fatal work accidents in the plant and animal production sector by year.

Years	Number of Work Accidents	Number of Fatal Work Accidents
2022	3,114	19
2021	3,060	19
2020	2,452	15
2019	2,758	18
2018	2,609	25

The work accident frequency rate, calculated per 100 full-time workers, was the lowest at 2.1 in 2020 and the highest at 2.6 in 2021. The work accident frequency rates by year in the Plant and Animal Production Sector are shown in Table 4 (SGK, 2018, 2019, 2020, 2021, 2022).

Table 4. Frequency rates of work accidents in the plant and animal production sector by year.

Years	Frequency Rate of Work Accidents
2022	2.5
2021	2.6
2020	2.1
2019	2.6
2018	2.5

In the Plant and Animal Production Sector, 13 workers contracted occupational diseases over the five years from 2018 to 2022. None of these occupational diseases resulted in death. The highest number of occupational diseases was recorded in

2018, with 5 cases. The number of workers contracting occupational and fatal occupational diseases per year in the Plant and Animal Production Sector is shown in Table 5 (SGK, 2018, 2019, 2020, 2021, 2022).

Table 5. Number of employees with occupational diseases and fatal occupational diseases in the plant and animal production sector by year.

Years	Number of Occupational Diseases	Number of Fatal Occupational Diseases
2022	2	0
2021	1	0
2020	1	0
2019	4	0
2018	5	0

In the Plant and Animal Production Sector, workers received 133,008 days of temporary incapacity reports over the five years from 2018 to 2022, with 128,037 days treated as outpatients and 4,971 days hospitalised. The highest number of days of incapacity, 32,767 days, occurred in 2021 when the COVID-19 pandemic was intensely experienced in Türkiye. The number of days of temporary incapacity due to work accidents by year in the Plant and Animal Production Sector is shown in Table 6 (SGK, 2018, 2019, 2020, 2021, 2022).

Table 6. Number of temporary disability days due to work accidents in the plant and animal production sector by year.

Years	Outpatient Treatment	Inpatient Treatment	Total
2022	28,843	974	29,817
2021	31,662	1,105	32,767
2020	22,790	711	23,501
2019	25,371	1,016	26,387
2018	19,371	1,165	20,536

A total of 2,700,296 work accidents occurred in Türkiye between 2018 and 2022, resulting in the deaths of 8,480 workers. During the same period, 5,901 workers were diagnosed with occupational diseases, and 48 workers died due to these diseases (SGK, 2018, 2019, 2020, 2021, 2022). According to the SGK data for 2022, which alone recorded 588,823 work accidents and 1,517 fatal work accidents, approximately one work accident occurs every 60 seconds in Türkiye, and four workers die each day due to these accidents.

In this study, data on occupational health and safety in the agricultural sector in Türkiye between 2018 and 2022 were examined, and the current situation in the sector was assessed in light of the findings. The results indicate that OHS practices in the agricultural sector are inadequate and need improvement.

Work accident rates remained relatively steady between 2018 and 2022. While a partial decrease was observed in 2020 (2.16%), the rate rose again to 2.64% in 2021. This fluctuation may be related to restrictions and a reduced workforce in agricultural activities during the COVID-19 pandemic in 2020. In 2021, as pandemic restrictions were lifted and work intensity increased, accident rates also rose.

Although the rate of fatal work accidents showed slight fluctuations over the years, it remained between 0.01% and 0.02%. While the limited number of fatal accidents suggests relatively low incidence, it also highlights the hazardous nature of agricultural activities and the need for further improvements in safety measures.

The rate of occupational diseases remains at very low levels (ranging from 0.00% to 0.0048%). However, these low rates may not fully reflect the health risks in agricultural activities. In particular, diseases related to pesticide exposure, heavy physical workload, and ergonomic issues may be underdiagnosed or unreported. Therefore, it is important to conduct more frequent health screenings and raise awareness regarding occupational diseases in the sector.

The rate of temporary incapacity days per employee also varies by year. The highest rate of incapacity days, 0.28%, was recorded in 2021. This increase indicates that health conditions and workload related to the intense period of the COVID-19 pandemic led to a rise in the rate of employees taking sick leave.

The analysis results suggest that stronger occupational health and safety measures are needed to reduce accident rates and prevent occupational diseases in the sector. Expanding training programs, tightening safety protocols, and conducting regular health screenings can help mitigate safety and health risks in the sector. Given the seasonal and physical challenges inherent in agricultural activities, these measures are essential to maintaining a sustainable work environment.

4. Conclusion

This study analyzes the status of occupational health and safety (OHS) in Türkiye’s agricultural sector by examining work accidents, occupational diseases, and temporary incapacity days. The high prevalence of informal and seasonal employment in the agricultural sector creates a risky environment for worker safety and health.

The findings of this study exhibit certain similarities and differences when compared to existing literature. Previous studies, such as Bakırcı (2011) and Seyhan and Seyhan (2015), emphasize that occupational accidents in the agricultural sector are predominantly associated with risks like machinery use, pesticide exposure, and heavy physical workload. These findings align with the primary causes of occupational accidents observed in our study during the 2018-2022 period. For instance, the prevalence of accidents involving tractors and

other agricultural machinery corroborates the conclusions drawn in earlier research.

Furthermore, the more recent data presented in our study highlights the trends in occupational accidents over the years, particularly emphasizing the impact of the COVID-19 pandemic on lost workdays. The increase in temporary incapacity days during the pandemic period underscores the influence of pandemic-specific conditions on occupational safety in the agricultural sector.

In the literature, studies like Gülçubuk (2017) and Yalçın et al. (2016) argue that seasonal and informal employment significantly complicates the implementation of occupational health and safety (OHS) measures in this sector. Similarly, our findings identify the high proportion of seasonal workers and limitations in access to social security as key structural challenges restricting the effectiveness of OHS practices.

Additionally, our study contributes to the literature by addressing the frequently reported inadequacies in diagnosing occupational diseases in the agricultural sector (e.g., Bakırcı, 2011; Seyhan & Seyhan, 2015). It suggests that the low reported rates of occupational diseases between 2018 and 2022 may be linked to underreporting and a lack of awareness.

The results indicate that current OHS measures are insufficient to effectively reduce work accidents and improve the diagnosis of occupational diseases in the sector. Key measures that should be implemented include expanding OHS training programs for workers, increasing safety education regarding the use of agricultural machinery, and conducting regular health screenings. Additionally, stricter enforcement of safety protocols and regular inspections are essential to prevent work accidents and occupational diseases. Improving access to essential facilities such as accommodation, hygiene, and healthcare services for seasonal workers is also critical for enhancing workplace health and safety in the sector.

For future research, it would be beneficial to conduct detailed analyses across different subfields within agriculture using larger datasets. Field studies on the causes of work accidents and risk analyses based on the demographic characteristics of sector employees would provide valuable insights for improving OHS policies. Such studies will contribute to establishing a sustainable work environment in the agricultural sector and enhancing OHS standards.

In conclusion, improving OHS in the agricultural sector is critical to protecting workers' health and well-being and ensuring sustainability. Utilising larger data sets in the future and examining the different sub-sectors in detail will contribute to developing more comprehensive and effective OHS policies.

Conflict of Interest

The author has no conflict of interest to declare.

References

- Akyüz, K. C., Yıldırım, İ., Tugay, T., Akyüz, İ., & Gedik, T. (2016). Orman ürünleri sanayi sektöründe iş kazası istatistiklerine genel bir bakış. *Düzce University Faculty of Forestry Journal of Forestry*, 12(2), 66-79. (In Turkish)
- Aritan, A. E., & Ataman, M. (2017). Kaza oranları hesaplamalarıyla iş kazası analizi. *Afyon Kocatepe Üniversitesi Fen ve Mühendislik Bilimleri Dergisi*, 17(1), 239-246. <https://doi.org/10.5578/fmbd.51762> (In Turkish)
- Bakırcı, N. (2011). Tarımda çalışanların sağlığı ve güvenliği. *TTB Mesleki Sağlık ve Güvenlik Dergisi*, 11(39), 7-13. (In Turkish)
- Demir, M. (2015). Mevsimlik tarım işçilerinin sosyal güvenlik haklarına ilişkin değerlendirmeler ve öneriler. *Çalışma ve Toplum*, 1(44), 177-194. (In Turkish)
- Engin, T. (2014). 6331 sayılı kanun çerçevesinde iş sağlığı ve güvenliği hizmetlerinin desteklenmesi (Master's thesis, Uludağ University). (In Turkish)
- Erginel, N., & Toptancı, Ş. (2017). İş kazası verilerinin olasılık dağılımları ile modellenmesi. *Journal of Engineering Sciences and Design*, 5, 201-212. <https://doi.org/10.21923/jesd.20116> (In Turkish)
- Gülçubuk, B. (2017). 6331 Sayılı İş Sağlığı ve Güvenliği Kanunu tarımda çalışanlar için bir şey ifade eder mi. *International Journal of Social Sciences and Education Research*, 3(2), 573-582. (In Turkish)
- Seyhan, S., & Seyhan, G. (2015). Tarım sektöründe iş sağlığı ve güvenliği. *Mühendislik Bilimleri ve Tasarım Dergisi*, 3(3), 549-552. (In Turkish)
- SGK. (2018). 2018 yılı istatistik bilgisi. <https://www.sgk.gov.tr/Istatistik/Yillik/fcd5e59b-6af9-4d90-a451-ee7500eb1cb4> (In Turkish)
- SGK. (2019). 2019 yılı istatistik bilgisi. <https://www.sgk.gov.tr/Istatistik/Yillik/fcd5e59b-6af9-4d90-a451-ee7500eb1cb4> (In Turkish)
- SGK. (2020). 2020 yılı istatistik bilgisi. <https://www.sgk.gov.tr/Istatistik/Yillik/fcd5e59b-6af9-4d90-a451-ee7500eb1cb4> (In Turkish)
- SGK. (2021). 2021 yılı istatistik bilgisi. <https://www.sgk.gov.tr/Istatistik/Yillik/fcd5e59b-6af9-4d90-a451-ee7500eb1cb4> (In Turkish)

- SGK. (2022). *2022 yılı istatistik bilgisi*. <https://www.sgk.gov.tr/Istatistik/Yillik/fcd5e59b-6af9-4d90-a451-ee7500eb1cb4> (In Turkish)
- SGK. (2024). *SGK veri uygulaması*. <https://veri.sgk.gov.tr/> (In Turkish)
- Social Security and General Health Insurance Law. (2006). *Republic of Türkiye, Law no: 5510*. <https://www.mevzuat.gov.tr/mevzuatmetin/1.5.5510.pdf> (In Turkish)
- Solmaz, E. (2023). Türkiye ekonomisinin sektörel analizi. In O. Bahar & M. Avcı (Eds.), *Tarım, ormancılık, balıkçılık sektörü ve gelişimi* (pp. 7-40). Efe Akademi Yayınları. (In Turkish)
- Suvla, R. Ş. (1949). *Genel ekonomi dersleri*. İstanbul Üniversitesi Yayınları. (In Turkish)
- TÜİK. (2023). *İşgücü istatistikleri, 2023*. <https://data.tuik.gov.tr/Bulten/Index?p=İsgucu-Istatistikleri-2023-53521#:~:text=2023> (In Turkish)
- Yalçın, G. E., Yazıcı, E., Kara, F. Ö., İpekçioğlu, Ş., & Yalçın, M. (2016). *Tarımda iş kazaları ve hastalıkları*. XII. Ulusal Tarım Ekonomisi Kongresi. Isparta. (In Turkish)