



Black Sea Journal of Agriculture

Volume 8 | Issue 4



ISSN: 2618 - 6578



**BLACK SEA JOURNAL OF AGRICULTURE
(BSJ AGRI)**



Black Sea Journal of Agriculture (BSJ Agri) is a double-blind peer-reviewed, open-access international journal published electronically 6 times (January, March, May, July, September, and November) in a year since January 2018. It publishes, in English, full-length original research articles, innovative papers, conference papers, reviews, mini-reviews, rapid communications or technical note on various aspects of agricultural science like agricultural economics, agricultural engineering, animal science, agronomy, including plant science, theoretical production ecology, horticulture, plant breeding, plant fertilization, plant protect and soil science, aquaculture, biological engineering, including genetic engineering and microbiology, environmental impacts of agriculture and forestry, food science, husbandry, irrigation and water management, land use, waste management etc.

ISSN: 2618 - 6578

Phone: +90 362 408 25 15

Fax: +90 362 408 25 15

Email: bsjagri@blackseapublishers.com

Web site: <http://dergipark.gov.tr/bsagriculture>

Sort of publication: Periodically 6 times (January, March, May, July, September, and November) in a year

Publication date and place: July 15, 2025- Samsun, TÜRKİYE

Publishing kind: Electronically

OWNER

Prof. Dr. Hasan ÖNDER

DIRECTOR IN CHARGE

Prof. Dr. Uğur ŞEN

EDITOR BOARDS

EDITOR IN CHIEF

Prof. Dr. Hasan ÖNDER, Ondokuz Mayıs University, TÜRKİYE

Prof. Dr. Uğur ŞEN, Ondokuz Mayıs University, TÜRKİYE

SECTION EDITORS*

Prof. Dr. Berna KILIÇ, Section Editor of Aquaculture, Ege University, TÜRKİYE

Prof. Dr. Ferhat UZUN, Section Editor of Field Crops, Ondokuz Mayıs University, TÜRKİYE

Prof. Dr. František KUMHÁLA, Section Editor of Agricultural Machinery and Technologies Engineering, Czech University of Life Sciences, CZECHIA

Prof. Dr. Hasan Gökhan DOĞAN, Section Editor of Agricultural Economics, Kirsehir Ahi Evran University, TÜRKİYE

Prof. Dr. Hasan MEYDAN, Section Editor of Agricultural Biotechnology, Akdeniz University, TÜRKİYE

Prof. Dr. Hsin CHI, Section Editor of Plant Protection, Fujian Agriculture and Forestry University, CHINA

Prof. Dr. José Pedro ARAÚJO, Section Editor of Animal and Veterinary Sciences, Instituto Politécnico de Viana do Castelo, PORTUGAL

Prof. Dr. Kadir Ersin TEMİZEL, Section Editor of Agricultural Structures and Irrigation, Ondokuz Mayıs University, TÜRKİYE

Prof. Dr. Kürşat KORKMAZ, Section Editor of Soil Science and Plant Nutrition, Ordu University, TÜRKİYE

Prof. Dr. Mahmut KESKİN, Section Editor of Animal and Veterinary Sciences, Hatay Mustafa Kemal University, TÜRKİYE

Prof. Dr. Muharrem ÖZCAN, Section Editor of Horticulture, Ondokuz Mayıs University, TÜRKİYE

Prof. Dr. Şerife Evrim ARICI, Section Editor of Plant Protection, Applied Sciences University of Isparta, TÜRKİYE

Prof. Dr. Ümran ÇİÇEK, Section Editor of Nutrition and Food Sciences, Tokat Gaziosmanpasa University, TÜRKİYE

Assoc. Prof. Dr. Bahodirjon NOSIROV, Section Editor of Agricultural Economics, Andijan Institute of Agriculture and Agrotechnologies, UZBEKISTAN

Assoc. Prof. Dr. Beata SITKOWSKA, Section Editor of Sustainable Agriculture, University of Science and Technology in Bydgoszcz, POLAND

Assoc. Prof. Dr. Jitka KUMHALOVA, Section Editor of Soil Science and Plant Nutrition, Czech University of Life Sciences Prague, CZECHIA

Assoc. Prof. Dr. Kadyrbay CHEKİROV, Section Editor of Biological Researches, Kyrgyz Turkish Manas University, KYRGYZSTAN

Assoc. Prof. Dr. Kemal Çağatay SELVİ, Section Editor of Agricultural Machinery and Technologies Engineering, Ondokuz Mayıs University, TÜRKİYE

Assoc. Prof. Dr. Mercedes CAMIÑA GARCÍA, Section Editor of Animal and Veterinary Sciences, University of Santiago de Compostela, SPAIN

Assoc. Prof. Dr. Sertan SESVEREN, Section Editor of Agricultural Structures and Irrigation, Kahramanmaraş Sütçü İmam University, TÜRKİYE

* The ranking is arranged alphabetically within the academic title

STATISTIC EDITOR

Assoc. Prof. Dr. Taner TUNÇ, Ondokuz Mayıs University, TÜRKİYE

ENGLISH EDITOR

Asst. Prof. Dr. Betül ÖZCAN DOST, Ondokuz Mayıs University, TÜRKİYE

REVIEWERS OF THE ISSUE*

- Prof. Dr. Gökmen Zafer PEKMEZCİ, Ondokuz Mayıs University, Department of Aquatic Diseases, Aquaculture and Fisheries, TÜRKİYE
- Prof. Dr. Çidem TAKMA, Ege University, Department of Animal Science, Biometry, TÜRKİYE
- Prof. Dr. Fatih ÖNER, Ordu University, Department of Field Crops, Precision Agriculture Technologies, TÜRKİYE
- Prof. Dr. Hüseyin GÜNGÖR, Düzce University, Department of Field Crops, Cereals and Legumes, TÜRKİYE
- Prof. Dr. İbrahim TAPKI, Hatay Mustafa Kemal University, Department of Animal Science, Stock Farming and Treatment, TÜRKİYE
- Prof. Dr. İnanç ÖZGEN, Fırat University, Department of Bioengineering, Entomology, TÜRKİYE
- Prof. Dr. İzzet AKÇA, Ondokuz Mayıs University, Department of Plant Protection, Entomology, TÜRKİYE
- Prof. Dr. Kağan KÖKTEN, Sivas Science and Technology University, Department of Field Crops, Pasture-Meadow Forage Plants, TÜRKİYE
- Prof. Dr. Mehmet Kerim GÜLLAP, Atatürk University, Department of Field Crops, Pasture-Meadow Forage Plants, TÜRKİYE
- Prof. Dr. Mehmet Serhat ODABAŞ, Ondokuz Mayıs University, Bafra Vocational School, Precision Agriculture Technologies, TÜRKİYE
- Prof. Dr. Metin DAĞTEKİN, Çukurova University, Ceyhan Technical College, Biosystem, TÜRKİYE
- Prof. Dr. Volkan OKATAN, Eskişehir Osmangazi University, Department of Horticulture, Pomology and Treatment, TÜRKİYE
- Assoc. Prof. Dr. Abdurrahim YILMAZ, Bolu Abant Izzet Baysal University, Department of Field Crops, Industrial Crops, TÜRKİYE
- Assoc. Prof. Dr. Aycan Mutlu YAĞANOĞLU, Atatürk University, Department of Animal Science, Biometry, TÜRKİYE
- Assoc. Prof. Dr. Emine Sema ÇETİN, Yozgat Bozok University, Department of Horticulture, Oenology and Viticulture, TÜRKİYE
- Assoc. Prof. Dr. Fuat LÜLE, Adıyaman University, Vocational School of Technical Sciences, Drying Technologies, TÜRKİYE
- Assoc. Prof. Dr. Harun ARSLAN, Atatürk University, Department of Basic Fisheries Sciences, Molecular Genetics, TÜRKİYE
- Assoc. Prof. Dr. Mohammad Mahmoodi SOURESTANI, Shahid Chamran University of Ahvaz, Department of Horticulture, Medicinal and Aromatic Plants, IRAN

- Assoc. Prof. Dr. Muhammed KÜPE, Ataturk University, Department of Horticulture, Pomology and Treatment, TÜRKİYE
- Assoc. Prof. Dr. Mustafa USTA, Van Yüzüncü Yıl University, Department of Plant Protection, Phytopathology, TÜRKİYE
- Assoc. Prof. Dr. Nadire Pelin BAHADIRLI, Hatay Mustafa Kemal University, Department of Plant Protection, Ethobotany, TÜRKİYE
- Assoc. Prof. Dr. Nur İlkay ABACI, Ondokuz Mayıs University, Department of Agricultural Economics, Agricultural Economics, TÜRKİYE
- Assoc. Prof. Dr. Serdar GENÇ, Kırşehir Ahi Evran University, Department of Agricultural Biotechnology, Stock Farming and Treatment, TÜRKİYE
- Assoc. Prof. Dr. Timuçin TAŞ, Balıkesir University, Department of Laboratory and Veterinary Health, Cereals and Legumes, TÜRKİYE
- Assist. Prof. Dr. Abdullah GÜLLER, Bingol University, Department of Plant Protection, Phytopathology, TÜRKİYE
- Assist. Prof. Dr. Ayşe Gül KASAPOĞLU, Erzurum Technical University, Department of Molecular Biology and Genetics, Molecular Genetics, TÜRKİYE
- Assist. Prof. Dr. Baboo ALİ, Çanakkale Onsekiz Mart University, Department of Field Crops, Cereals and Legumes, TÜRKİYE
- Assist. Prof. Dr. Bahadır DEMİREL, Erciyes University, Faculty of Agriculture, Department of Biosystems Engineering, Biosystem, TÜRKİYE
- Assist. Prof. Dr. Bahadır ŞİN, Sakarya University of Applied Sciences, Department of Plant Protection, Entomology, TÜRKİYE
- Assist. Prof. Dr. Esra YAVUZ, Şırnak University, Department of Accounting and Tax, Artificial Intelligence, TÜRKİYE
- Assist. Prof. Dr. Kevser YAZAR, Selçuk University, Department of Horticulture, Oenology and Viticulture, TÜRKİYE
- Assist. Prof. Dr. Murat HELVACI, European University of Lefke, Department of Horticultural Production and Marketing, Entomology, TURKISH REPUBLIC OF NORTHERN CYPRUS
- Dr. Deniz Çağla BAL, Namık Kemal University, Department of Agricultural Economics, Agribusiness, TÜRKİYE
- Dr. Derviş Emre DOĞAN, Ondokuz Mayıs University, Department of Horticulture, Pomology and Treatment, TÜRKİYE
- Dr. Ebru ERGÜNEŞ BERKİN, Hassa District Directorate of Agriculture and Forestry, Artificial Intelligence, TÜRKİYE
- Dr. Fatima Zohra ALLAM, Polytechnic School of Algeria, Department of Mechanical Engineering, Biometry, ALGERIA

Dr. Hilal YILMAZ, Kocaeli University, Department of Plant and Animal Production, Cereals and Legumes, TÜRKİYE

Dr. Okompu Davina ABERJI, Dennis Osadebay University, Department of Agricultural Economics and Agribusiness, Agribusiness, NIGERIA

* The ranking is arranged alphabetically within the academic title

Table of Contents

Research Articles

1. EFFECT OF SEWAGE SLUDGE AND BARNYARD MANURE ON GROWTH, NUTRIENT UPTAKE, AND HEAVY METAL ACCUMULATION IN LETTUCE
Sibel BOYSAN CANAL.....440-446
2. HOUSEHOLD DEMAND FOR FISH IN OSHIMILI NORTH LOCAL GOVERNMENT AREA OF DELTA STATE, NIGERIA
Eguono Aramide IKPOZA, Victor CHUKS-OKONTA, Okompu Davina ABERJI, Ebruvwiyo EDOJA, Anyanwu THANK GOD.....447-453
3. INSECTICIDAL POTENTIAL OF SILVER NANOPARTICLES PRODUCED USING HAZELNUT GREEN LEAFY COVER EXTRACTS AGAINST HAZELNUT APHID, *Myzocallis coryli* (Goeze, 1778)
Onur AKER.....454-462
4. ESTIMATION OF FRICTION COEFFICIENTS OF SOYBEAN SEEDS WITH SOFT COMPUTING APPROACH
Elçin YEŞİLOĞLU CEVHER, Demet YILDIRIM, Gürkan Alp Kağan GÜRDİL.....463-475
5. TRENDS IN CALF MORTALITY: A BIBLIOMETRIC OVERVIEW
Ayşe Övgü ŞEN, Rabia ALBAYRAK DELİALİOĞLU, Yasin ALTAY, Akdoğan Kaan Can TEKBİLEK.....476-486
6. FIRST DETECTION OF 'CANDIDATUS PHYTOPLASMA AUSTRALASIA' IN ROBINIA PSEUDOACACIA: MOLECULAR CHARACTERIZATION AND TISSUE-SPECIFIC DISTRIBUTION
Hümeysra AYVACI, Mehmet Ertuğrul GÜLDÜR, Murat DİKİLİTAŞ.....487-494
7. EFFECTS OF FINANCIAL INCLUSION ON ARABLE CROP PRODUCTIVITY IN BAYELSA STATE, NIGERIA
Michael Ige Ediabai EDABA, Adeyinka Richard AROYEHUN, Favour Chinomnso EDABA.....495-504
8. CHARACTERIZATION OF THE ELEMENTAL CONSTITUENTS, PHENOLIC PROFILE, AND ANTIOXIDANT CAPACITY OF CULTIVATED HOREHOUND (*Marrubium vulgare L.*) LEAVES FROM VAN, TÜRKİYE
Lütfi NOHUTÇU.....505-509
9. THE EFFECTS OF NITROGEN FERTILIZATION ON QUALITY AND ANTIOXIDANT COMPOUNDS IN ALPHONSE LAVALLÉE GRAPE VARIETIES
Filiz HALLAŞ TÜRK.....510-517
10. DETERMINATION OF YIELD AND NUTRITIONAL VALUE OF POKUT PLATEAU PASTURE (RIZE)
Muhammed İkbal ÇATAL.....518-524
11. PREDICTION MODEL OF ALBUMEN INDEX IN DUCK EGGS VIA EXTERNAL QUALITY CHARACTERISTICS IN CASE OF MULTICOLLINEARITY
Kadriye KURŞUN, İsmail GÖK.....525-532

12. TECHNOLOGICAL TRANSFORMATION AND SUSTAINABLE AGRICULTURE: AUTOMATION SUPPORTED HOME-TYPE HYDROPONIC PRODUCTION SYSTEM APPLICATION	
<i>Muhammed Akif YENİKAYA, Onur OKTAYSOY, Gökhan KERSE.....</i>	533-547
13. ASSESSMENT OF LARVAL DENSITY AND DAMAGE BY LEPIDOPTERAN SPECIES COMPLEX IN SOME SWEET AND DENT MAIZE CULTIVARS IN HATAY PROVINCE	
<i>İbrahim Ersin BOZDOĞAN, Nihat DEMIREL, Ömer KONUŞKAN, Hatice ASİL.....</i>	548-555
14. DETERMINATION OF THE EFFECT OF CHINABERRY TREE (MELIA AZEDARACH L.) LEAF AND FRUIT EXTRACTS ON GERMINATION OF MAIZE (ZEA MAYS L.) SEEDS INFECTED WITH FUSARIUM VERTICILLIOIDES	
<i>Rahime CENGİZ, Zehra YILDIZ.....</i>	556-562
15. GENOME-WIDE IN SILICO ANALYSIS AND IDENTIFICATION OF BOS TAURUS SOX GENE FAMILY	
<i>Yusuf Ziya GÜZEY, Emre İLHAN.....</i>	563-569

Reviews

16. THE STRATEGIC ROLE OF MUĞLA PROVINCE IN OLIVE AND OLIVE OIL PRODUCTION IN TÜRKİYE	
<i>Halil İbrahim SAĞBAŞ.....</i>	570-577
17. THE TRANSFORMATIVE IMPACT OF ARTIFICIAL INTELLIGENCE AND SENSOR TECHNOLOGIES ON DAIRY LIVESTOCK EXPORTS	
<i>Hatice DİLAYER, Kamil Fatih DİLAYER.....</i>	578-586