Volume 13 Issue 01
December 2023

ទស្សនាវដ្តីកសិកម្មកម្ពុជា

Cambodian Journal of Agriculture

ISSN 1029-8835

Cambodian Journal of Agriculture (CJA) is the leading agricultural scientific journal in Cambodia. It was first founded in 1997 and operated by the Cambodia Association of Agriculture (CAA), formerly known as the Cambodian Society of Agriculture (CSA). The journal accepts publications of both fundamental and applied sciences in Agriculture, Fisheries, Forestry, Environment, Development, Policy, Community Sustainability, Climate Change and other relevant fields. The main objective of CJA is to provide venues for agricultural scientists to communicate and share their research results and to build an agricultural research network in the country and the region.

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មាតិកា **ទំព័រ**

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Foreword

The year 2023 brought us back together with a new look, new team and new passion. Now, it's time to pay farewell to the 2023 and welcome in 2024!

Happy New Year 2024!

Happy New Year from all of us at the Cambodian Journal of Agriculture! We are so grateful for all the support we have received in 2023 that not only to bring back the journal but also to bring the new vision, new spirit and new passion to build a fragile research culture in the country. We hope the year 2024 will further strengthening this ambition and to witness more accomplishments on the growth of scientific achievement in Cambodia and beyond.

Along with the coming new year, I have a great pleasure to bring you the 13th edition of the Cambodian Journal of Agriculture. In this new edition, we have a review paper on the vegetables production in Cambodia, three interrelated papers on pesticides used on tomato production, and an assessment study on the impact of cassava production on the Cambodian environment.

Thanks to all authors of these articles, to relevant editors and reviewers for their contributions and dedications to keep the journal quality in place. Last but not least to all individuals and institutions who have provided all kinds of support for the publication of the journal.

With my best wishes to all for the new year 2024,

Truly yours,

Prof. Dr. Men Sarom

Editor-in-Chief

Cambodian Journal of Agriculture

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ផលិតកម្មដំណាំបន្លែក្នុងប្រទេសកម្ពុជា: កត្តារារាំង និងយុទ្ធសាស្ត្រគន្លឹះ

The Vegetable Production in Cambodia: Challenges and Key Strategies

Ouch Sreynech[1, *], Thun Vathany[1], Ouk Makara[2], Song Young-ju[3]

[1] *Cambodian Agricultural Research and Development Institute*

[2] *Plant Breeder*

[3] *Korean Partnership for Innovation of Agriculture (KOPIA) Cambodia Center*

**Corresponding author:*
sreynech.ouch@yahoo.com

This paper was edited by:
Tho Kim Eang, Royal University of Agriculture, Cambodia

Buntong Borarin, Royal University of Agriculture, Cambodia

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Abstract

Vegetable production in Cambodia faced many challenges. There have been strong supports from government institutions and development partners to strengthen and modernize the industry to meet these challenges. Unfortunately, these supports are not well coordinated and the problem remains persistent. Cambodia has a great potential to increase vegetable production, both quantity and quality, to meet local demand and export competitiveness. To achieve this potential, four key strategies are suggested, and they are (i) increase accessibility and affordability of modernized technologies to farmers, (ii) enhance the effectiveness of agricultural extension, (iii) expand vegetable production area, and (iv) improve value chain competition in vegetable production. To implement these four key strategies effectively there is a vital need of strengthening linkage among stakeholders, increase investment in research for development, extension agencies, adaptation of modern technology, and supporting infrastructure facilities.

Keywords: *Vegetable production, challenges, key strategies*

សេចក្តីសង្ខេប

ដោយប្រឈមនឹងបញ្ហាជាច្រើនផលិតកម្មបន្លែកម្ពុជានៅមិនទាន់អាចបំពេញតម្រូវការក្នុងប្រទេសនៅឡើយ បើទោះជាមានការនាំចេញនូវបន្លែមួយចំនួនក៏ដោយ ។ កន្លងមក មានការគាំទ្រជាច្រើនពីអង្គភាពរាជរដ្ឋាភិបាល ដៃគូអភិវឌ្ឍន៍ អង្គការក្រៅរដ្ឋាភិបាល និងអ្នកពាក់ព័ន្ធដ៏ទៃទៀត ប៉ុន្តែផលិតកម្មបន្លែនៅតែមិនអាចដោះស្រាយនូវបញ្ហាប្រឈមទាំងនោះ ពីព្រោះតែការគាំទ្រទាំងនោះនៅមិនទាន់មានការសម្របសម្រួលឲ្យសុខដុមរម្យនានៅឡើយ។ ជាការពិត កម្ពុជាមានសក្តានុពលក្នុងការបង្កើនផលិតកម្មបន្លែទាំងបរិមាណ និងគុណភាព ដើម្បីបំពេញតម្រូវការក្នុងប្រទេស និងភាពប្រកួតប្រជែងក្នុងការនាំចេញ។ ដើម្បីសម្រេចបាននូវសក្តានុពលនេះ យុទ្ធសាស្ត្រគន្លឹះចំនួនបួនត្រូវបានស្នើឲ្យពិចារណា។ យុទ្ធសាស្ត្រគន្លឹះទាំងបួននេះមាន (១) បង្កើននូវភាពងាយស្រួលទទួលបាន និងមានតម្លៃសមរម្យនូវបច្ចេកទេសទំនើបៗសម្រាប់កសិករ (២) លើកកម្ពស់ប្រសិទ្ធភាពនៃអ្នកផ្សព្វផ្សាយកសិកម្ម (៣) ពង្រីកផ្ទៃដីដាំដុះបន្លែ និង (៤) ធ្វើឲ្យប្រសើរឡើងនូវភាពប្រកួតប្រជែងក្នុងច្រវាក់ផលិតកម្មបន្លែ។ ដើម្បីអនុវត្តយុទ្ធសាស្ត្រគន្លឹះទាំងនេះឲ្យមានប្រសិទ្ធភាព គឺចាំបាច់ណាស់ត្រូវតែពង្រឹងទំនាក់ទំនងចំណោមអ្នកពាក់ព័ន្ធទាំងអស់ និងបង្កើនការវិនិយោគទៅលើការស្រាវជ្រាវសម្រាប់អភិវឌ្ឍ ក្នាក់ងារផ្សព្វផ្សាយ ការបន្សាំនូវបច្ចកទេសទំនើប និងការគាំទ្រដល់ហេដ្ឋារចនាសម្ព័ន្ធ។

ពាក្យគន្លឹះ: *ផលិតកម្មដំណាំបន្លែ កត្តាររាំង យុទ្ធសាស្ត្រគន្លឹះ*

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ឥទ្ធិពលនៃវិធីសាស្ត្រលាងក្នុងការកាត់បន្ថយសំណល់ថ្នាំកសិកម្មលើផ្លែប៉េងប៉ោះ

Effectiveness of Washing Techniques for Reducing Pesticide Residues on Tomato

ម៉េង ចាន្នី[1] ,ទង សុជាតិ[1] , ប៊ុនតុង បូរាវិន[1] , ជួប វីរៈ[1,*]

[1] *ផ្នែកស្រាវជ្រាវ និងផ្សព្វផ្សាយ, សាកលវិទ្យាល័យភូមិន្ទកសិកម្ម ប្រទេសកម្ពុជា*

* *អាសយដ្ឋានទំនាក់ទំនង៖* cvireak@rua.edu.kh

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ប៉េងប៉ោះជាដំណាំងាយទទួលរងការរាតត្បាតពីជំងឺ ក៏ដូចជាសត្វល្អិតចង្រៃ ដែលធ្វើឱ្យមានការប្រើថ្នាំកសិកម្មដើម្បីបង្ការនិងការពារ ជាប្រការមិនអាចចៀសបាន។ ដូច្នេះដើម្បីសុវត្ថិភាព ការលាងសម្អាតតាមវិធីសាស្ត្រផ្សេងៗ ដើម្បីកាត់បន្ថយសំណល់ថ្នាំកសិកម្ម មុនពេលបរិភោគស្រស់ បានត្រូវណែនាំ។ ឆ្លើយតបនឹងទស្សន: និងវិធីសាស្ត្រនេះ ការសិក្សាអំពីឥទ្ធិពលនៃវិធីសាស្ត្រលាងក្នុងការកាត់បន្ថយសំណល់ថ្នាំកសិកម្មលើផ្លែប៉េងប៉ោះបានត្រូវអនុវត្ត។ សំណាកជាផ្លែប៉េងប៉ោះត្រូវបានជ្រលក់ជាមួយសមាសធាតុគីមីមានដូចជា Fenvalerate, Cyhalothrin (Lambda), Cypermethrin, Beta-Endosulfan, Dimethoate និង Deltamethrin។ ហើយបន្ទាប់មកបានលាងជាមួយវិធីសាស្ត្រ ត្រាំទឹកអំបិល លាងទឹកបង្ហូរ ត្រាំទឹកអំបិលរួចលាងទឹកបង្ហូរ។ វិធីសាស្ត្រដែលមានប្រសិទ្ធភាពខ្ពស់ជាងគេ ត្រូវបានយកមកលាងជាមួយនឹងប៉េងប៉ោះដែលមិនជ្រលក់សមាសធាតុគីមី និងប្រៀបធៀបសំណល់ថ្នាំកសិកម្មដែលនៅសល់ក្រោយលាងជាមួយស្តង់ដារ (Maximum Residue Limit) MRLs របស់ Europe និង Codex។ ការរៀបចំសំណាកនិងវិភាគដោយប្រើវិធីសាស្ត្រ QuEChERS និងម៉ាស៊ីន GC MS/MS។ ជាលទ្ធផលបានបង្ហាញថា ការលាងដោយត្រាំទឹកអំបិលរយៈពេល៥នាទី រួចលាងទឹកបង្ហូររយៈពេល១នាទី មានប្រសិទ្ធភាពខ្ពស់ ក្នុងការកាត់បន្ថយសំណល់ថ្នាំកសិកម្មរហូតទៅដល់៩៩,៩% ដែលបរិមាណនៅសល់ក្រោយលាងគឺទាបជាងស្តង់ដារ MRL។

Keywords: *ការលាងទឹកបង្ហូរ, ការត្រាំទឹកអំបិល, វិធីសាស្ត្រ*

Abstract

Tomato production is known to be attacked by many pests and diseases making the use of pesticides essential. Therefore, for fresh consumption properly wash before eating is likely to be a safe strategy. In response to this concern, the topic "Effectiveness of washing techniques for reducing pesticide residue on tomatoes" was studied. Fenvalerate, Cyhalothrin (Lambda),

Cypermethrin, Beta-Endosulfan, Dimethoate, and Deltamethrin were among the pesticide chemical compounds used in the study to inoculate tomatoes in order to determine the effects of washing on tomatoes. The samples were cleaned by procedures such as soaking in a 2% salt solution, tapping water, and combining soaking salt and tapping water, and then the final residues were assessed after washing. The most effective treatment was assessed by comparing the amount of pesticide residue left after washing with EU and Codex MRL standards using tomatoes from a farm in Kandal and Battambang provinces. Preparation of analytical samples using the QuEChERS Method and analysis of pesticide residues by GC MS/MS. The results revealed that washing with a 2% salt solution for 5 minutes and then using tap water for 1 minute significantly reduced residues, up 68% to 99.9%, which means the amount of pesticide residue left after washing was lower than the MRL standard of the EU and Codex. Hence, this washing treatment is a good method to use to wash tomatoes before consuming them both fresh and cooked, since this method can reduce the high percentage of pesticide residue.

Keywords: *Tapping water, Soaking salt solution, MRL Standard, QuEChERS Method, GC MS/MS*

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ការកំណត់អត្តសញ្ញាណ និងបរិមាណសំណល់ថ្នាំកសិកម្មក្រោយការបាញ់ថ្នាំនៅក្នុងប៉េងប៉ោះ ពីខេត្តកណ្តាលដោយប្រើប្រាស់ GC MS/MS

Qualification and Quantification of Multi Pesticide Residue on Post Pesticides Spraying Tomato from Kandal Province

ប៉ម លីហ្សា[២], ទង សុជាតិ[១], ប៊ុនតុង បូរាវិន[១], ជួប វីរៈ[១,*]

[១,២] *ផ្នែកស្រាវជ្រាវ និងផ្សព្វផ្សាយ, សាកលវិទ្យាល័យភូមិន្ទកសិកម្ម*
**អាសយដ្ឋានទំនាក់ទំនង៖* cvireak@rua.edu.kh

អត្ថបទនេះត្រូវបានពិនិត្យដោយ៖

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Keywords: *វិធីសាស្ត្រ QuEChERS, ស្តង់ដារ MRL, ម៉ាស៊ីន GC MS/MS*

Abstract

Tomato fruits are rich in nutrients important for our diet. However, production of tomato faces challenges from insects and diseases, that requires the use of pesticides to control them. It is crucial to practice caution and use chemical fertilizers and pesticides appropriately and in correct quantities during tomato cultivation. Misuse can lead to wasted time, money, environmental damage, and pose health hazards to consumers. To address these concerns, a study has been conducted to determine the type and quantity of pesticide residue on tomatoes sprayed in Kandal Province, utilizing GC MS/MS technology. Samples were collected from a farm ranked first in Kandal Province and seven chemical compounds were analysed, including Acetamiprid, Carbofuran, Chlorfenapyr, Cypermethrin, Fipronil, and Chlorpyrifos. These compounds were compared to the standard Maximum Residue Limit (MRL) of Europe and Codex. The sample preparation and analysis were performed using the QuEChERS method and the GC MS/MS machines. The results indicate that tomatoes from the net house contained only chlorpyrifos at a concentration of 0.0080 or 0.008 mg/g. For samples planted in the field 14 days after pesticide spraying, residues of Acetamiprid 0.4262 ± 0.0036 mg/g), Chlorfenapyr (0.0056 or 0.005 mg/g), Cypermethrin (0.0292 ± 0.0025 mg/g), and Chlorpyrifos (0.0145 ± 0.0016 mg/g) were found. All the residue amounts of these active components were below the standard MRLs of Europe and Codex.

Keywords: *QuEChERS method, MRL Standards, GC MS/MS machine*

Cambodian Journal of Agriculture
Vol. 13, Issue 01 December, 2023

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THE EVALUATION OF PESTICIDE RESIDUES IN TOMATOES AT MARKETS IN PHNOM PENH BY GC-MS/MS

សំ ជីវន្ត[1], ជួប រីរៈ[1,*], ប៊ុនតុង បូរាវិន[1], ទង សុជាតិ[1]

[1] ផ្នែកស្រាវជ្រាវ និងផ្សព្វផ្សាយ
*អាសយដ្ឋានទំនាក់ទំនង៖
cvireak@rua.edu.kh

អត្ថបទនេះត្រូវបានពិនិត្យ និងកែសម្រួលដោយ៖

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ពាក្យគន្លឹះ: *វិធីសាស្ត្រ QuEChERS, សំណល់ថ្នាំកសិកម្ម, ម៉ាស៊ីន GC MS/MS, ស្តង់ដារ MRL*

Abstract

The use of pesticides to control pest and disease in tomato production is unavoidable. Overdose usage of pesticide causes serious concern over food safety particularly on fresh tomato fruits for fresh consumption. This study was conducted to quantify the pesticide residues on tomato purchase from wet and super markets in Phnom Penh by using GC MS/MS. Total of 16 samples were collected from wet market (n=8) and super market (n=8). Sample was collected and preserved in sealed plastic bag and stored in cool box. Later, it was stored in freezer (-20 degree Celsius) before the extraction. QuEChERS Method was adopted in this sample extraction. Six active compounds of pesticide were used to quantify in this study such as Acetamiprid, Chlorfenapyr, Chlorpyrifos, Cypermethrin, Fipronil and Carbofuran. Consequently, both local and imported tomato from wet market contain highest residues and higher than EU and CODEX MRL such as Carbofuran (45.15±15.94)µg/kg and (68.50 ±9.62)µg/kg, Chlorfenapyr (129.2 ±60.8)µg/kg and (135.75±60.10)µg/kg, Cypermethrin (76.93±14.11)µg/kg and (198.85±142.95)µg/kg, and Chlorpyrifos (19.20±11.29)µg/kg and (28.03±8.38)µg/kg, respectively. However, for Fipronil, the residues amount was all below EU MRLs. Furthermore, the majority sample of both imported and local tomato from supermarket has residue lower than EU MRLs. In conclusion, these result shows that the local planted tomatoes sold in supermarket is safer to consume in term of pesticide residues. Nevertheless, attention should be given for both local and imported tomatoes sold in wet market.

Keywords: *QuEChERS, Residue pesticide, GC MS/MS, MRL Standard*

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Environmental Impact Assessment on the Production of Cassava in Cambodia

Men Sarom[1, *], Buntong Borarin[1], Hing Thida[1], Ly Tyneth[2]

[1] *Royal University of Agriculture, Phnom Penh, Cambodia*

[2] *Cambodian Agricultural Research and Development Institute*

**Corresponding author:* *msarom55@gmail.com*

This paper was edited by:
Dr. Tho Kim Eang, Royal University of Agriculture, Cambodia

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Abstract

Cassava has become the second largest crop production and contributes substantially to the country economy after rice. The expansion of cassava from a homestead to a commercial crop, and to the second largest crop production in the country raised many concerns especially in its relation to soil nutrient property and its structure. A study was carried out in 2014 to (i) assess the extent that cassava plantation could causes soil erosion and the depletion of soil nutrients and soil organic matter (organic carbon), and to (ii) identify practical mitigation measures that can be adopted by small-scale farmers to sustain their cassava production. The study was conducted in Kampong Cham and Pailin using both quantitative and qualitative approaches, involving individual surveys with cassava farmers, and taking soil samplings in the cassava and non-cassava production areas. Testing was conducted in the laboratory to measure soil nutrient content (NPK), pH and soil organic matter (SOM). Results showed that more than half of the cassava production is grown on sloping land particularly at the northwestern region of the country where land preparation is inappropriately practiced causing soil prone to erosion especially if it is associated with heavy rainfall. However, there is no differences in soil nutrients as well as the level of pH, soil humidity and organic matter in both study areas. Conclusion was drawn that with appropriate cultivation practices, cassava production plays no harm to the environment just like the other crops do.

Keywords: *Cassava, EIA, Soil organic matter*

សេចក្តីសង្ខេប

ដំឡូងមីបានក្លាយជាផលិតកម្មដំណាំធំជាងគេទីពីរ និងបានរួមចំណែកយ៉ាងច្រើនដល់សេដ្ឋកិច្ចរបស់ប្រទេសកម្ពុជាបន្ទាប់ពីស្រូវ។ ការពង្រីកការដាំដុះដំណាំដំឡូងមី ពីការដាំបន្ទាប់បន្សំនៅជុំវិញផ្ទះ ទៅជាដំណាំពាណិជ្ជកម្ម និងរហូតក្លាយទៅជាការផលិតធំជាងគេទីពីរក្នុងប្រទេស បានធ្វើឱ្យមានការព្រួយបារម្ភជាច្រើន ជាពិសេសទាក់ទងនឹងសារធាតុចិញ្ចឹមរបស់ដី និងរចនាសម្ព័ន្ធរបស់ដី។ ការសិក្សាមួយត្រូវបានធ្វើឡើងក្នុងឆ្នាំ ២០១៤ ដើម្បី (១) វាយតម្លៃពីវិសាលភាពដែលថា ការដាំដំឡូងមីអាចបណ្តាលឱ្យមានសំណឹកដី និងការថយចុះនៃសារធាតុចិញ្ចឹមរបស់ដី ក៏ដូចជាសារធាតុខនិជក្នុងដី (កាបូនសរីរាង្គ) និងដើម្បី (២) កំណត់វិធានការកាត់បន្ថយជាក់ស្តែងដែលអាចទទួលយកបានដោយកសិករខ្នាតតូច ដើម្បីទ្រទ្រង់ផលិតកម្មដំឡូងមី។ ការសិក្សានេះធ្វើឡើងក្នុងខេត្តកំពង់ចាម និងប៉ៃលិន ដោយប្រើវិធីសាស្ត្របរិមាណ និងគុណភាព ពាក់

ព័ន្ធនឹងការស្ទង់មតិជាបុគ្គលជាមួយកសិករដាំដុះដំឡូងមី និងការចាប់យកសំណាកដី នៅក្នុងតំបន់ផលិតដំឡូងមី និងមិនមែនដំឡូងមីមកវិភាគ និងធ្វើតេស្តនៅក្នុងមន្ទីរពិសោធន៍ដើម្បីវាស់បរិមាណសារធាតុចិញ្ចឹមក្នុងដី (NPK) pH និងសារធាតុខនិជក្នុងដី (Soil Organic Matter-SOM) ។ លទ្ធផលបានបង្ហាញថា ជាងពាក់កណ្តាលនៃផលិតកម្មដំឡូងមី ត្រូវបានដាំដុះនៅលើដីជម្រាល ជាពិសេសនៅតំបន់ភាគពាយ័ព្យនៃប្រទេស ដែលការរៀបចំដីមិនត្រូវបានអនុវត្តដោយត្រឹមត្រូវ ដែលបណ្តាលឱ្យដីងាយរងទៅនឹងសំណឹក ជាពិសេសប្រសិនបើមានភ្លៀងធ្លាក់ខ្លាំង។ ទោះជាយ៉ាងណាក៏ដោយ មិនមានភាពខុសគ្នានៃសារធាតុចិញ្ចឹមរបស់ដី ក៏ដូចជាកម្រិត pH សំណើមដី និងសារធាតុខនិជ នៅក្នុងតំបន់សិក្សាទាំងពីរនោះទេ។ ជារួមយើងអាចសន្និដ្ឋានបានថា ជាមួយនឹងការអនុវត្តការដាំដុះសមស្រប ផលិតកម្មដំឡូងមីមិនប៉ះពាល់ដល់បរិស្ថានដូចការលើកឡើងនោះទេ។

ពាក្យគន្លឹះ: *ផលិតកម្មដំឡូងមី ផលប៉ះពាល់បរិស្ថាន សារធាតុខនិជក្នុងដី*

Instructions to Authors

1. Editorial Policy

The Cambodian Journal of Agriculture is a national journal devotes to publications related Agriculture, Forestry, Fisheries, Environment, Agricultural Policies, Rural and Community Development, and other relevant topics. Manuscripts that submitted to the journal must have original research reports and must be written in English or Khmer. The manuscripts are accepted for review as long as they have not been published or considered for publication elsewhere and all authors or institutions where the research or work was implemented have no objection for its publications in the journal. Criteria for publication must be novelty, innovation, originality and significance in improving knowledge and know-hows of the above-described disciplines.

The length of research articles should be more than 4,000 words for the text including title, authors, acknowledgements, references, tables and figure legends. Short communications (Agri-notes) are considered for presentation of short observations that do not mandate full-length papers. It should include determined data and should not be warrant the preliminary observations.

Manuscripts are accepted on the disciplinary topics which could be relevant to agriculture, forestry, fisheries, environment, policies and other related fields.

2. Research Ethics

Research ethic is considered as a very crucial aspect for all manuscripts that allow them to prepare under strict observation.

The journal has its own rights to withdraw the manuscript of any researches that do not follow the ethics. The Cambodian Journal of Agriculture will investigate "*Plagiarism*" by all means including using online detection Plagscan (https://www.plagscan.com/en/). It is recommended that the authors to check plagiarism in advance by using a specific program given by their institutes or any other online or similar sources before manuscript submission.

3. Authorship

The Cambodian Journal of Agriculture appraises all authors responsible for the submission. The main author or corresponding author shall be listed with detailed contact information. Co-authors in the paper submitted to CJAS must have agreed to

have their name included. People who assist on supply strains or lab assistance, data analysis and consulting the paper are not required to be listed as authors, however may be included in the acknowledgement section.

4. Review Process

The manuscripts are confidential and reviewed by members of the Editorial Board and competent reviewers. Once the manuscripts submitted to the Editor in Chief, it is then submitted to the editors who are specialized in the field. Three reviewers are asked to provide recommendations or comments to the manuscripts regarding some key aspects such as originality of research work, clarity of methodology and experimental design, and validity and verifiable of research results.

The corresponding author is informed within an appropriate time after manuscript submission. If the manuscript is requested for revision, it should be resubmitted back to the Journal Secretariat in a specified time.

5. Submission of Manuscripts

Editor-in-Chief of the Cambodian Journal of Agriculture accepts the submission of manuscripts through email: cja@rua.edu.kh. The texts and tables must be submitted in word document (.doc). Figures with high resolution should be an embedded zip file (.rar). The submission must consist of three separated files: authors' submission letter (pdf), main document (.doc) and table/figure file (.doc).

6. Organization of Format

Authors should follow the general format for consistencies of all published articles:

- The most desirable structure for organizing a paper includes: Abstract, Introduction, Materials and Methods, Results, Discussion, Acknowledgments, and References. Results and Discussion can be a combined section.
- The submission must be divided into two Microsoft Word files. The first file is the main document contained all of texts. The second file is for all tables and figures used in the main text, which arranged in numerical order of appearance.
- The preferable font style is **Time New Roman** with the standard size 12 points for general texts with double space and align text left. In case this preferable font is not available, a justification note should be made to the publisher.

- Sub-heading must be bold and size 13 points. First letter of first word is capitalized; all others are lowercase, except proper nouns.
- Line numbers must be added for the main document
- Paper size is standard A4, with 1 inch (2.5cm) of all margins (top, bottom, left and right).
- For article written in Khmer language, authors names should follow Khmer style, i.e family name first followed by the given name. For example, it shall be written Sin Sisimiut (ស៊ីន ស៊ីសាមុត) not Sisimiut Sin (ស៊ីសាមុត ស៊ីន).
- Spelling in Khmer written article must follow Samdach Sang Chuon Nat's dictionary and Khmer OS System 12 points should be used.
- For English language, either American or British English could be used, but NOT BOTH.
- Layout of the general format could be viewed in the **Annex 1**.

***Tittle*:** section should consist of the tittle of the article, author's names, and affiliations and email address of the corresponding author. The tittle must be **Time New Roman (size: 14 and bold) or Khmer OS Moul Light 14 points.** It should be clearly described the work, not to exceed 150 characters including spaces. The first letter of each proper noun must be capitalized.

***Abstract*:** The authors are advised to write in both Khmer and English for the abstracts. The editor team will offer the assistance on translation from English to Khmer for articles with all foreign authors. The abstract has to be a summary of the research from the introduction to the discussion. The abstract should be single paragraph, not be exceeded 250 words with the state of aims, methods, results and conclusion. References or undefined abbreviations are not recommended in the abstract. Keywords must be listed below the abstract that will be important for searching, but should not be below three or more than ten words with alphabetically order.

***Introduction*:** should state the rationale of the research and its connection to other previous works. Clear aims and objectives of the research should also be included in this section. Extensive literature review should not include in this section.

***Material and Methods*:** Should be concise to allow replication of the experiments. A simple reference is enough for commonly used materials and methods. It is very important to identify the method and use the citation to modify as several alternative methodologies.

***Results*:** the result of the experiment should be presented in logical sequence in the text, tables and figures. A concise presentation of the major observation is very important. Similar data in both table and figure, many uses of graphs to present data must be avoided.

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***Acknowledgements*:** should be short and foregoing the references. Any financial support granted for the research being published must be stated in the Acknowledgement section.

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***Tables and Figures*:** All tables and Figures aim to be published in the CJAS should be self-contained with concise heading and footnote. Results can be presented in either table or figure but not both.

- All tables and figures must be taken out of the main document and placed in another Microsoft Word file.
- Tables and figures must be arranged based on the order appear in the main document (NOT all tables come first and all figure come next, or the other way around).
- If possible, they should be combined for efficiency.

- All tables must be in word format, single space, and font size could be slightly flexible for easy reading.
- First letter of first word of label is capitalized; all others are lowercase, except proper nouns.
- Footnotes should be included to explain any nonstandard abbreviations, brief statistical analyses or extra description deemed necessary, to ensure that they could be understood quickly. Avoid using symbols of statistically significant for other purposes.
- The **Annex 2** shows good examples of tables and figures suggested for CJAS publications.

Numeric and Measurements

- Commas in numerals of 4 digits or more (except for digits used as designations). If the manuscript is written in Khmer, its standard for numerals and digits must be complied.
- Zero in front of decimal points.
- In lists where one item is multi-digit, use numerals throughout.
- Spell out numbers at the beginning of a sentence (if number is spelled out, unit of measure also should be spelled out). -fold: threefold, manyfold, 10-fold.
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- Do not abbreviate measurements in titles.
- Time: second (s), minute (min), hour (h), day, week, month, year.
- Volume: liter (spell out), but ml, µl, etc.
- Use degree Celsius for temperature (eg. 70°C). In case, the author wishes to use also degree Fahrenheit, degree Celsius should put in the parenthesis.

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Author could also apply for **Short Communication** for preliminary results which could be useful and attract further research. A Short Communication is not more than 4 printed pages in length. Authors should submit a suitable manuscript with research methods, records, models and pioneering results. Short Communications are limited to a maximum of two figures and one table. (1) Abstracts are limited to 100 words of English with Khmer translation; (2) instead of a separate Materials and Methods section, experimental procedures may be incorporated into Figure Legends and Table footnotes; (3) Results and Discussion should be combined into a single section. Reference must not be more than 10 with short-Harvard's style of reference.

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10. Contact Details

Cambodian Journal of Agriculture (CJA)

C/o Division of Research and Extension, Royal University of Agriculture

Chamkar Daung, P.O.Box 2696. Khan Dangkor 12401, Phnom Penh, Cambodia

Email: cja@rua.edu.kh

Tel: (+855)85 999 457/ (+855) 70 822 910

សមាគមកសិកម្មកម្ពុជា

Cambodia Association of Agriculture

សមាគមនេះមានឈ្មោះជាភាសាខ្មែរថា (សមាគមកសិកម្មកម្ពុជា) សរសេរជាអក្សរកាត់ថា(ស.ក.ក) និងមានឈ្មោះជាភាសាអង់គ្លេសថា (Cambodian Association of Agriculture) សរសេរជាអក្សរកាត់ថា (CAA)។ សមាគមកសិកម្មកម្ពុជា គឺជាសមាគមដែលបម្រើឱ្យប្រយោជន៍សាធារណៈ ឯករាជ្យ អព្យាក្រឹត មិនបម្រើឱ្យគណបក្សនយោបាយ មិនស្វែងរកប្រាក់ចំណេញ មានភាពយេនឌ័រ មិនប្រកាន់ពូជសាសន៍ ពណ៌សម្បុរ និងជំនឿសាសនា គាំទ្រ និងលើកកម្ពស់ដល់ការស្រាវជ្រាវវិទ្យាសាស្ត្រ បច្ចេកវិទ្យា និងនវានុវត្តន៍ និងចូលរួមកសាងសមត្ថភាពស្រាវជ្រាវ អប់រំ និងផ្សព្វផ្សាយ។

ដើម្បីធានាឱ្យការអនុវត្តសកម្មភាពការងាររបស់សមាគមកសិកម្មកម្ពុជា ប្រព្រឹត្តទៅដោយជោគជ័យ ការដឹកនាំរបស់ ស.ក.ក ត្រូវបានរៀបចំ និងធ្វើឡើងតាមរចនាសម្ព័ន្ធដូចខាងក្រោម៖

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For more Information, Questions, or Inquiries

Email : cja@rua.edu.kh

Tel : (855) 85 999 457 / 12 822 910 / 70 822 910

Facebook : Cambodian Journal of Agriculture

Address : Division of Research and Extension, Royal University of Agriculture
Dangkor District, Phnom Penh, Cambodia

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ISSN 1029-8835