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COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Item 8 of the Provisional Agenda

INTERGOVERNMENTAL TECHNICAL WORKING GROUP ON MICROORGANISM AND INVERTEBRATE GENETIC RESOURCES FOR FOOD AND AGRICULTURE

First Session

Rome, 25–27 September 2024

MICROBIAL AND INVERTEBRATE BIOLOGICAL CONTROL AGENTS AND MICROBIAL BIOSTIMULANTS: FOLLOW-UP

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I. INTRODUCTION

1. The Commission on Genetic Resources for Food and Agriculture (Commission), at its Nineteenth Regular Session, reiterated its invitation to countries to promote the sustainable management of biological control agents (BCAs) and biostimulants and to take action to promote cooperation and networking among stakeholders in the fields of biological control and the use of biostimulants, for example by supporting the establishment of networking platforms at regional or global levels.[1]

2. The Commission also recommended exploration of the need for the development of information systems related to the conservation and sustainable use of microbial and invertebrate BCAs and microbial biostimulants, for example inventories of organisms, impact metrics or relevant policies. It further recommended promotion of capacity development in the management of microbial and invertebrate BCAs and microbial biostimulants.[2]

3. The Commission further recommended the organization of an open-ended workshop with the aim of: (i) raising awareness of the potential of BCAs and biostimulants; (ii) reviewing the global regulatory situation regarding the import and export of BCAs and biostimulants, and access and benefit-sharing (ABS) arrangements for relevant genetic resources; (iii) identifying possible regulatory gaps and unnecessary restrictions affecting the use of BCAs and biostimulants; and (iv) addressing environmental risk assessment for BCAs.[3]

4. This document recalls potential actions on microbial and invertebrate BCAs and microbial biostimulants highlighted in Background Study Paper No. 71 and seeks the Working Group's views regarding any action it may wish to recommend that the Commission take in this field. Further information on the topic may be found in the documents *Conservation and sustainable use of microbial and invertebrate biological control agents and microbial biostimulants*[4] and Background Study Paper No. 71.[5] The Working Group may also wish to react to the outcomes of the open-ended workshop, which will be reported during the session.

II. BACKGROUND

5. The Commission, at its Seventeenth Regular Session, adopted its Work Plan for the Sustainable Use and Conservation of Micro-organism and Invertebrate Genetic Resources for Food and Agriculture (Work Plan).[6]

6. In line with the Work Plan, the Commission, at its Eighteenth Regular Session, addressed microbial and invertebrate biological control agents and microbial biostimulants, based on a draft study commissioned by FAO.[7] The Commission welcomed the draft study and requested FAO to finalize it, taking into account comments provided, publish it as background study paper and disseminate it.[2] The finalized draft was subsequently published as Background Study Paper No. 71.[8] The Commission requested FAO to ensure that the findings of the study are taken into consideration in its work relevant to BCAs and biostimulants. It also invited countries to promote the sustainable

[1] CGRFA-19/23/Report, paragraph 92.
[2] CGRFA-19/23/Report, paragraph 93.
[3] CGRFA-19/23/Report, paragraph 91.
[4] CGRFA-19/23/9.3.2.
[5] Buitenhuis, R., Cock, M.J.W., Colmenarez, Y.C., De Clercq, P., Edgington, S., Gadaleta, P. *et al*. 2023. *Sustainable use and conservation of microbial and invertebrate biological control agents and microbial biostimulants*. Background Study Paper No. 71. Commission on Genetic Resources for Food and Agriculture. Rome, FAO. https://doi.org/10.4060/cb3571en
[6] CGRFA-17/19/Report, *Appendix E*.
[7] CGRFA-18/21/11.1/Inf.1.
[8] Buitenhuis, R., Cock, M.J.W., Colmenarez, Y.C., De Clercq, P., Edgington, S., Gadaleta, P. *et al*. 2023. *Sustainable use and conservation of microbial and invertebrate biological control agents and microbial biostimulants*. Background Study Paper No. 71. Commission on Genetic Resources for Food and Agriculture. Rome, FAO. https://doi.org/10.4060/cb3571en

management of BCAs and biostimulants and to ensure they are given due consideration in relevant local, national, regional and international policies and policy-development processes.[9]

III. OPEN-ENDE WORKSHOP ON BIOLOGICAL CONTROL AGENTS AND BIOSTIMULANTS

7. As requested by the Commission, an open-ended workshop on biocontrol and biostimulants will be held immediately preceding the date of the first session of the Intergovernmental Technical Working Group on Microorganism and Invertebrate Genetic Resources for Food and Agriculture (Working Group).[10] A summary of key outcomes of the workshop will be made available to the Working Group.

IV. OPTIONS FOR ACTION

8. In response to the Commission's recommendation an open-ended workshop on biocontrol and biostimulants will be held on 23 and 24 September 2024 in Rome, Italy. The workshop will take place back-to-back with the first session of the Working Group.

9. The Working Group will therefore have the opportunity to consider possible actions on biocontrol agents and biostimulants in the light of further insights its Members may receive via the workshop. Background Study Paper No. 71 presents ten specific recommendations, aimed mostly at national governments but in several cases also implying potential for action at intergovernmental level.

- The conservation of natural enemies for biological control in crops and natural habitats should be an explicit objective in international standards on good agricultural practices and stewardship of natural areas, and in national and international policies for integrated pest management.
- National and international measures should be taken to strengthen research, including public-sector research, on the taxonomy and use of BCAs and to improve collections and other services (e.g. training of PhD-level scientists) and infrastructure (e.g. laboratories and quarantine facilities) that support biological control.
- National and international measures should be taken to educate farmers and conservationists on the benefits of natural enemies and their management and to increase their participation in research and implementation in order to promote successful uptake of biological control.
- National and international measures should be taken to promote community science initiatives that would engage the general public in the study and conservation of natural enemies.
- National and international measures should be taken to improve knowledge of the negative effects of pesticides on natural enemies, and this knowledge should be made openly accessible to farmers.
- The conservation of habitats of natural enemy species for biological control of future non-native pest problems in other countries should be an explicit element of national and international measures to conserve biodiversity in agroecosystems and natural ecosystems. Conservation and sustainable use of natural enemies can be further formalized and applied through conservation biological control practices.
- Government authorities should adopt simplified measures for access to and exchange of BCAs or consider exemption of these activities from the scope of their ABS regimes.
- Governments should develop appropriate national regulatory systems for BCAs that encourage and support the development of new agents for classical biological control and methods to enhance augmentative biological control. They should harmonize regulatory

[9] CGRFA-18/21/Report, paragraph 89.
[10] https://www.fao.org/cgrfa/meetings/open-ended-workshop-on-biological-control-agents-and-biostimulants/en

requirements and promote knowledge sharing at the international level to facilitate the development of effective biological control programmes.

- In considering future measures for conservation and use of genetic resources for food and agriculture, governments should consider a broad approach to the conservation and sustainable use of biodiversity, including access to knowledge and capacity building; components of such an approach will help improve the use and conservation of BCAs.
- Governments should encourage initiatives that educate the public on the benefits of biological control, including its role in protecting the food supply (Sustainable Development Goal [SDG] 2) and terrestrial ecosystems (SDG 15), improving health (SDG 3), promoting sustainable production and consumption (SDG 12) and combating climate change (SDG 13).

10. Action to strengthen the sustainable use and conservation of invertebrate and microbial BCAs and microbial biostimulants is needed in a range of technical and policy areas. Drawing on Background Study Paper No. 71, key examples are briefly discussed in the following subsections, highlighting potential opportunities for action by the Commission.

Conservation

11. Efforts to address threats to microbial and invertebrate BCAs, and to a lesser extent microbial biostimulants, and to promote conservation measures for them, are urgently needed. Microbial and invertebrate BCAs and microbial biostimulants can be expected to benefit from generic actions that lead to improvements in the conservation of the microorganism and invertebrate biodiversity found in and around production systems. However, some specific priorities can be identified. With regard to *ex situ* conservation of BCAs, there is a need to support efforts to improve coordination among culture collection organizations. Capacity to store whole microorganism communities (microbiomes) is providing new opportunities for *ex situ* conservation, and there is a need to ensure that microbial BCAs and biostimulants are adequately included in initiatives in this field.

Sustainable use

12. The uptake of microbial and invertebrate BCAs and microbial biostimulants in food and agriculture needs to be promoted. This is particularly the case in developing countries, where BCAs and biostimulants could have a substantial impact in terms of increasing productivity, reducing environmental degradation and improving safety. Promoting uptake will require a facilitating framework with respect to, *inter alia*, the state of knowledge, capacity, cooperation, policy and legislation. Despite progress at the research level, genetic improvement of BCAs has had little practical impact to date. Constraints related, *inter alia*, to ABS issues and to knowledge gaps need to be addressed.

Exchange

13. Ensuring efficient exchange of microbial and invertebrate BCAs, including internationally, is vital to the development and implementation of biocontrol practices. This appears to be a key area of concern for many stakeholders working in the biocontrol sector.

14. To date, relevant Commission activities in this field have included coverage of microorganism and invertebrate genetic resources in the *Elements to facilitate domestic implementation of access and benefit-sharing for different subsectors of genetic resources for food and agriculture – with explanatory notes*.[11]

15. The Commission will presumably wish to ensure that microbial and invertebrate BCAs and microbial biostimulants are adequately addressed in any future work related to the exchange of genetic resources. Suggestions for practical steps include the establishment of an interactive site via which importing and exporting countries could establish terms of exchange. The development of a multilateral framework specifically aimed at facilitating access to and use of microbial and

[11] FAO. 2019. *ABS Elements: Elements to facilitate domestic implementation of access and benefit-sharing for different subsectors of genetic resources for food and agriculture – with explanatory notes*. Rome. https://openknowledge.fao.org/handle/20.500.14283/ca5088en

invertebrate BCAs and the sharing of benefits arising from their use could be considered, and the Commission could potentially consider what role it could play in this regard.

Knowledge gaps

16. Improvements to the management of microbial and invertebrate BCAs and microbial biostimulants require knowledge of their characteristics, their roles in the supply of ecosystem services, their risk status and distribution, the threats affecting them, techniques for their use and conservation, and trends in the adoption of practices involving their use. Research on the management of BCAs and biostimulants can potentially be facilitated via capacity development, promoting access to data and information, developing or strengthening policy and legal frameworks, and promoting collaboration among researchers and between researchers and other stakeholders.

17. Assessment and monitoring of genetic resources and biodiversity – both overseeing the collection, management and diffusion of data at global level and supporting action at country level – have traditionally been key Commission activities.

Capacity development

18. The critical lack of human and material resources for the identification and characterization of microbial and invertebrate BCAs and microbial biostimulants, especially those that provide natural or conservation biological control, needs to be addressed. Action is particularly required in tropical and subtropical areas. National policy and legal frameworks for the management of microbial and invertebrate BCAs and microbial biostimulants often need to be strengthened or better implemented. Awareness raising among policymakers and provision of guidance on the development of policies and legislation are needed.

19. The Commission has, over the years, developed or endorsed guidelines on various technical aspects of genetic resources management, mostly for animal and plant genetic resources and mostly covering aspects of conservation, characterization and breeding. It could potentially consider whether there is any need for such instruments or publications in the case of microbial and invertebrate BCAs and microbial biostimulants and whether it is in a position to address this need, including, as relevant, what kinds of collaborative partnerships with other organizations might be needed in this regard.

Knowledge diffusion

20. There is a need to promote the diffusion of knowledge about invertebrate and microbial BCAs and microbial biostimulants to those who need it.

21. Promoting the diffusion of knowledge related to genetic resources and biodiversity and their management is a major aspect of the Commission's work, whether via the outputs of global assessments, reporting on the implementation of global plans of action, the publication of guidelines or the operation of information systems such as the Domestic Animal Diversity Information System (DAD-IS)[12] and the World Information and Early Warning System on Plant Genetic Resources for Food and Agriculture (WIEWS).[13]

22. The Commission could potentially consider what it could do in this regard for microbial and invertebrate BCAs and microbial biostimulants. As indicated above, the Commission, at its last Session, noted the potential value of developing information systems related to the conservation and sustainable use of microbial and invertebrate BCAs and microbial biostimulants.[14] Other options might include support for an online knowledge portal featuring items such as relevant national policy frameworks and metrics of biological control impacts, or more dynamic virtual communities of practice and associated multistakeholder innovation platforms. Existing tools for knowledge diffusion need to be taken into account and promoted, and options explored for collaboration with other organizations working in the field.

[12] https://www.fao.org/dad-is/en/
[13] https://www.fao.org/wiews/en/
[14] CGRFA-19/23/Report, paragraph 93.

Cooperation and networking

23. All aspects of the management of microbial and invertebrate BCAs and microbial biostimulants would benefit from improved cooperation and networking among stakeholders. The Commission could potentially consider what it could do to promote objectives of this kind. This might include, for example, supporting the establishment of networking platforms that facilitate the identification of expertise for country-level, regional or wider collaborative initiatives, including, in the case of classical biological control programmes, the identification of collaborators in the region of origin of invasive pests. Another option could be stimulating the establishment and operation of research incubators, innovation hubs and working groups covering different aspects of biological control. These could operate at regional or interregional level and could serve as platforms for delivering relevant expertise to developing countries.

Mainstreaming

24. The use and conservation of microbial and invertebrate BCAs and microbial biostimulants are significant to many policy objectives and potentially affected by a range of different policies, including those addressing climate change, sustainable food systems (including agricultural pollution mitigation), One Health, and the conservation (including restoration) and sustainable use of biodiversity in general. As noted above, they are relevant to many of the SDGs. There is a need to raise awareness of these links and to explore opportunities for mainstreaming the management of microbial and invertebrate BCAs and microbial biostimulants into such policies at all levels.

25. The Commission could potentially consider what awareness-raising or facilitating role it might play in terms of ensuring that microbial and invertebrate BCAs and microbial biostimulants are adequately taken into account in policy dialogues and in UN-level working groups, joint commissions or funds.

V. GUIDANCE SOUGHT

26. The Working Group may wish to consider:

- whether the global regulatory situation regarding the import and export of microbial and invertebrate BCAs and microbial biostimulants, and regarding ABS arrangements for relevant genetic resources, needs to be improved, and, as relevant, what could be done to improve it;
- whether there are regulatory gaps and unnecessary restrictions affecting the use of BCAs and biostimulants, and, as relevant, what could be done to address them;
- whether procedures for assessing environmental risks associated with BCAs are adequate, and, as relevant, what could be done to improve them;
- what could be done to improve information systems related to the conservation and sustainable use of microbial and invertebrate BCAs and microbial biostimulants;
- what could be done to improve the state of knowledge of microbial and invertebrate BCAs and microbial biostimulants and ensure the availability of this knowledge to relevant stakeholders;
- what could be done to promote the sustainable use of microbial and invertebrate BCAs and microbial biostimulants;
- what could be done to improve conservation programmes for microbial and invertebrate BCAs and microbial biostimulants; and
- what could be done to raise awareness of the roles of microbial and invertebrate BCAs and microbial biostimulants;

and to provide recommendations to the Commission on these matters.