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Ministry of Agriculture
Plant Protection Directorate
Department: Agricultural Pests

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التاريخ: / /2025

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Submission to IPPC Secretariat — Call for information material for commodity standards for apples (Malus domestica)

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Technical input — PRA, pest list, trade & production context, and recommended phytosanitary measures for the Annex to ISPM 46 (International movement of Malus domestica fruit for consumption)

1. Executive summary (for the IPPC Technical Panel on Commodity Standards — TPCS)

This submission provides technical information and national PRA conclusions from the Republic of Iraq relevant to the development of an Annex to ISPM 46 for *Malus domestica* fruit for consumption. It contains:

- a concise, evidence-based pest list (quarantine and regulated non-quarantine pests) affecting apples in Iraq;
- a summary PRA (entry, establishment, spread, impacts) for priority pests;
- proposed commodity definitions, recommended phytosanitary measures (pre- and post-harvest, packinghouse, inspection, sampling and treatment options), and supporting implementation needs;
- The national production and trade context showing major production provinces and import/export flows relevant to risk and management.

Key rationale:

Iraq is a net importer (>300,000 t from Iran in 2022) and has concentrated apple production in northern and central provinces. High import volumes make robust, commodity-specific measures for apples important to manage cross-border pest movement and facilitate safe trade. This submission recommends science-based, operational measures aligned with ISPM Nos. 2, 4, 11, 21 and ISPM 46 principles.

2. Commodity definition (proposed text for Annex)

Commodity: Fresh apple fruit, *Malus domestica* Borkh., intended for human consumption (fresh market).

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Commodity description (recommended): Fresh whole apples (with pedicel attached or removed), free from leaves and excessive soil, packed in consumer or bulk packaging, and intended for direct sale to consumers, retail or wholesale packers. Include all major cultivars. Exclude apples intended for processing, propagation (rooted/grafted nursery material) or long-term storage if those are covered by different standards.

3. Production & trade context relevant to risk (Iraq-specific evidence to inform Annex drafting)

- **National production (2022, FAO/Helgi):** ≈ 77,800 t.

Major producing provinces (approx. 2022 breakdown — used for surveillance and prioritization):

Dohuk ≈ 12,450 t; Erbil ≈ 14,004 t; Sulaymaniyah ≈ 10,900 t; Nineveh ≈ 14,004 t; Kirkuk ≈ 7,780 t; Diyala ≈ 7,780 t; Wasit ≈ 6,224 t; Baghdad (selected areas) ≈ 4,668 t. (Total ≈ 77,810 t).

Note: Kurdistan region provinces (Dohuk, Erbil, and Sulaymaniyah) account for ~48% of national production in our estimates. These figures are approximations used for surveillance prioritization; official provincial stats should be used where available.

- **Trade (fresh apples, HS 080810) — recent 2022 customs-reported flows (WITS/Comtrade):**

Imports to Iraq (2022): Iran ≈ 323,165 t; Turkey ≈ 51,823 t; Lebanon ≈ 8,768 t; EU aggregate ≈ 2,044 t. (Total from the top supplier's ≈ **387,816 t).**

Exports from Iraq (2022): negligible; small, irregular shipments historically to Turkey and UAE, typically <1,000 t/year.

Implication for Annex: Large import volumes require robust commodity measures (pre-border certification, packinghouse protocols, inspection/sampling and defined treatments) to reduce pest entry risk.

4. Pest list for *Malus domestica* (Iraq input) — recommended Annex structure

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List pests relevant to apples moved for consumption. For each pest include: scientific name, pest category (quarantine / RNQP / non-regulated), brief rationale.

4.1 Priority quarantine pests (recommend these be specifically addressed in Annex)

Erwinia amylovora (Fire blight) — Quarantine pest / high consequence risk. Rationale: destructive bacterial pathogen of Rosaceae; detected in the region (isolations in Erbil pears) and can be moved via infected propagative or contaminated material; while fruit is a low-likelihood pathway for systemic infection, the pathogen can be present on infected blossoms/fruit surfaces or on contaminated packing material and tools. Requires actions aimed at preventing entry via nursery material and rigorous packinghouse hygiene/traceability.

Cydia pomonella (Codling moth) — Quarantine or regulated pest depending on importing country. Rationale: primary fruit-borer; larvae within fruit evade superficial inspection; living larvae in fruit shipments can cause interception and spread.

(Note: specific national/regional quarantine lists vary — the Annex should provide a recommended core list and allow contracting parties to add regionally relevant pests.)

4.2 Regulated non-quarantine pests (RNQPs) and important non-quarantine pests

Venturia inaequalis (Apple scab) — Regulated non-quarantine pest in trade of planting material; quality issue for fruit. Rationale: mainly spread by infected plant material and conidia; blemished fruit cause market rejection but fruit for consumption is a lower pathway for long-distance spread of primary inoculum. Include guidance on sorting and quality standards.

Aphis pomi, *Dysaphis plantaginea* (Apple aphids) — RNQP / quality pest. Cause honeydew, sooty mould; may vector viruses; small mobile insects may be present on fruit stems/stalks.

Quadraspidiotus perniciosus (San Jose scale) — RNQP / quarantine in some areas. Scale presence on fruit/peduncles or plant material may be a pathway.

4.3 Other pests to be considered (storage and postharvest)

Mites, fungal storage pathogens and fruit fly species where relevant in other regions (Annex should provide optional checklists relating to regional pest contexts).

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5. Short pest risk assessments (condensed; to be appended to Annex or referenced)

5.1 *Cydia pomonella* (Codling moth)

Pathway(s): Infested fruit with larvae; packing material; nursery stock.

Likelihood of entry via fruit: Medium — living larvae concealed within fruit can survive transport.

Establishment potential: High where hosts and climate exist.

Impact: High — direct losses, market rejections, phytosanitary interceptions.

Management implication: Requires pre-harvest orchard management (degree-day informed sprays, mating disruption), packinghouse sorting, cut-test sampling, and minimum cold/heat treatment or fumigation options where required by importer.

5.2 *Venturia inaequalis* (Apple scab)

Pathway(s): Primarily via infected plant material and local dispersal (conidia). Fruit may carry scab lesions but are not the main long-distance pathway for primary inoculum.

Likelihood of entry via fruit: Low-moderate for further spread; high for trade rejections due to quality standards.

Management implication: Sorting, visual inspection, and quality limits on acceptable scab levels for export; orchard sanitation and fungicide programs recommended.

5.3 *Erwinia amylovora* (Fire blight)

Pathway(s): Infected propagation material is main pathway; contaminated surfaces, tools, packing materials and possibly symptomatic fruit may carry inoculum.

Likelihood of entry via fruit: Low but non-zero if symptomatic tissues or contaminated surfaces are present. High impact if introduced.

Management implication: Prohibit import of infected nursery material; require pest-free production declarations for exporters; packinghouse hygiene and traceability essential.

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(Full PRAs should be attached as technical annexes when submitting country dossiers; this submission provides concise risk characterizations to guide Annex measure selection.)

6. Proposed commodity specific phytosanitary measures (to be included in ISPM 46 Annex)

Below is a set of recommended measures (pre-harvest, harvest, packinghouse, transport, inspection, sampling and treatments) that the TPCS may consider including. Measures are aligned with ISPM No. 2, No. 4, No. 11 and No. 21 principles and are actionable for NPPOs and commercial operators.

A. Pre-harvest requirements (grower/production site)

1. Pest management: Documented IPM programme in orchard for key pests (codling moth, scab, aphids): monitoring records (pheromone trap data for *C. pomonella*), degree-day models, pesticide spray records and biological control measures.

2. Orchard hygiene: Removal of mummified fruit, fallen fruit and leaf-litter to reduce inoculum and overwintering pests.

3. Use of certified planting material: For orchards in pest-free area or intended to supply export fruit, use officially certified pest-free nursery stock.

4. Record-keeping: Maintain traceable production records (orchard block IDs, harvest dates, pest control actions).

B. Harvest handling

1. Careful harvesting: Minimize fruit damage to reduce risk of secondary infections and pest entry.

2. Pre-sorting in field: Remove symptomatic/infested fruit prior to transport to packinghouse.

C. Packinghouse and post-harvest measures

1. Segregation and traceability: Maintain chain-of-custody for orchard lots; use labeled pallets and lot codes.

2. Inspection and sorting: Visual inspection, mechanical and manual sorting to remove fruit with codling-moth entry, scab lesions, sooty moulds or scale.

3. Cut-test sampling: Lot-based destructive sampling (cut-tests) for *C. pomonella* (sampling intensity guided by pest prevalence and importing country requirements). Suggested baseline: 0.5–1% of cartons per lot (adjusts per pest status and risk tolerance).

4. Packinghouse hygiene: Regular cleaning, disinfection of equipment, crates and surfaces to prevent cross-contamination (especially for *E. amylovora).*

5. Cold chain documentation: Maintain temperature records for cold storage and transport; cold treatment protocols where required by importers (see treatment options below).

6. Phytosanitary certification: NPPO-issued phytosanitary certificate attesting to compliance with specified measures and results of inspection/sampling.

D. Port / border phytosanitary inspection

1. Document checks: Verify exporter declarations, orchard traceability, phytosanitary certificates, and treatment and packinghouse records.

2. Risk-based sampling: Visual inspection of shipments and targeted destructive sampling for pests (codling moth larvae, presence of aphids/scale). Sample sizes and protocols should be risk-based (higher sampling for origins with known pest issues).

3. Action on non-compliance: Rejection, treatment (approved and effective), re-export or destruction; mandatory incident reporting to exporting NPPO and IPPC contact point if a quarantine pest is intercepted.

E. Approved post-harvest treatments (examples — Annex should present options and conditions)

1. Cold treatment protocols (species and treatment schedules to be specified per pest and import tolerance; cold durations and temperatures must be supported by validated research for *C. pomonella* and other pests).

2. Heat treatment or hot-water dip (where validated for pest control and fruit quality).

3. Fumigation (e.g., phosphine or methyl bromide alternatives where permitted) — only if efficacious, permitted by importing country and with MRL/food-safety considerations. Note methyl bromide restrictions under the Montreal Protocol should be observed; alternatives preferred.

4. Controlled atmosphere protocols (if scientifically validated for target pests).

- ***Important: The Annex should include a table of validated treatment options per pest (scientific references, temperature/time schedules and efficacy) or provide references to existing treatment manuals (e.g., IPPC treatment manual) and recognize that some treatments are pest- and cultivar-specific.***

F. Specific recommendations for *Cydia pomonella*

Pre-harvest: Monitor pheromone traps; apply degree-day based insecticide timing or mating disruption in high-pressure areas.

Packinghouse: Mandatory cut-tests on representative sample lots; reject lots with evidence of live larvae above a low tolerance (e.g., >0.1% of sampled fruit positive for live larvae).

Treatments: If importing country requires, include validated cold or heat treatments for *C. pomonella*. The Annex should offer validated treatment schedules or direct readers to the IPPC Treatment Manual.

G. Specific recommendations for *Venturia inaequalis*

Quality standard: Include maximum allowable visual scab level per lot (to be decided by TPCS / contracting parties based on market tolerance).

Pre-harvest: Encourage resistant cultivars and protectant fungicide applications during infection risk periods.

Packinghouse: Sorting and rejection of heavily scabbed fruit.

H. Specific recommendations for *Erwinia amylovora*

Prevent entry: Prohibit import of infected nursery material; require phytosanitary certificates confirming freedom from *E. amylovora* for propagative plant material.

Packinghouse: Rigorous cleaning and disinfection; exclude symptomatic fruit and any material with signs of bacterial ooze.

If detected at border: Follow ISPM No. 9 guidelines for eradication/containment and immediate notification to IPPC.

7. Sampling and inspection protocols (proposed text)

- **Risk-based sampling:**

The Annex should recommend risk-based sampling intensities with baseline recommendations (e.g., visual inspection of 100% of cartons for obvious pests; destructive cut-test sample 0.5–1% of cartons per lot for concealed pests like *C. pomonella*, increased where prevalence is known or origin is high risk).

- **Laboratory diagnostics:**

Where visual inspection is insufficient (e.g., bacterial pathogens), require laboratory testing (PCR for *E. amylovora*) and defined procedures for sample submission and turnaround.

8. Traceability, record-keeping and audit

- Require lot-based traceability from orchard to final consignment (orchard ID, harvest date, packinghouse code).
- Keep records of monitoring (pheromone trap data), pesticide/fungicide sprays, treatments applied, packinghouse sorting logs and cold-chain temperature records for a minimum of 12 months (or per importing country requirement).
- NPPOs should be able to audit packinghouses and production sites on request.

9. Capacity and implementation needs (practical considerations for contracting parties)

To implement Annex measures effectively, many NPPOs will require support for:

1. Laboratory capacity (PCR for *E. amylovora*, molecular ID of intercepted pests).
2. Surveillance networks (pheromone trap networks, scab forecasting systems — leaf wetness and temperature sensors).
3. Training in packinghouse hygiene, sampling and cut-test procedures, and chain-of-custody systems.
4. Risk communication and extension to growers on IPM and record-keeping.

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Iraq's experience demonstrates the importance of these investments given large import volumes and concentrated production areas.

10. Suggested appendices for the Annex (technical annexes to support implementation)

- *Appendix A: Pest list (quarantine, RNQP, other relevant pests) with short PRAs and references.*
- *Appendix B: Validated treatment schedules for target pests (cold, heat, fumigation, controlled atmosphere), including references to the IPPC Treatment Manual and peer-reviewed validations.*
- *Appendix C: Sampling and inspection protocols (statistical sampling tables, cut-test protocols).*
- *Appendix D: Example phytosanitary certificate statements and orchard/packinghouse declarations (model wording for exporters).*
- *Appendix E: Traceability templates (lot codes, chain-of-custody forms).*
- *Appendix F: Country-specific production and trade data (example: Iraq production provinces & volumes; 2022 import/export flows).*

11. Supporting data & references (from Iraq submission)

(Selected references used to support the PRA and these proposals; the Annex should require contracting parties to provide country-specific references where available.)

ISPM No. 2 (2007) — Framework for pest risk analysis. IPPC/FAO.

ISPM No. 4 (1995) — Requirements for the establishment of pest-free areas. IPPC/FAO.

ISPM No. 5 (2024) — Glossary of phytosanitary terms. IPPC/FAO.

ISPM No. 11 (2019) — Pest risk analysis for quarantine pests. IPPC/FAO.

ISPM No. 21 (2004) — Pest risk analysis for regulated non-quarantine pests. IPPC/FAO.

1. National PRA: Apple Fruit Pests — Pest Risk Analysis (PRA) in Iraq, Department of Plant Protection, Ministry of Agriculture (Dr. S. Jabbar Abbas), 9 October 2025 (this submission).
2. CABI datasheet: *Cydia pomonella* (Codling moth).
3. WITS/Comtrade (2022) trade data — HS 080810 (apples fresh): Iran → Iraq ≈ 323,165,000 kg; Turkey → Iraq ≈ 51,823,200 kg, etc.
4. FAO/Helgi Library (2022): Iraq apple production ≈ 77,800 t.

Local regional reports: Isolations of *Erwinia amylovora* from Erbil (regional lab reports 2022); Rudaw reports on Kurdistan apple production issues (2020).

12. Final statement & willingness to cooperate

The Department of Plant Protection of the Ministry of Agriculture (Iraq) submits this technical input to support TPCS development of an Annex to ISPM 46. We offer to provide:

- The full technical PRA annexes and datasets (cut-tests, pheromone trap data, laboratory test protocols) upon request;
- Further clarification or country-specific examples of phytosanitary certificate wording, sampling forms, and validated treatment schedules; and
- Participation, where feasible, in TPCS working groups or intercessional drafting (subject to NPPO approval)

We recognize the submission deadline (15 October 2025) and offer this contribution for consideration by the TPCS at its December drafting meeting.

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