Sustainable Agriculture Standard
SAS ECO – TECHNICAL GUIDELINE DOCUMENT

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1. Introduction

SAS Eco is a sustainability assurance framework developed under the Sustainable Agriculture Standard (SAS) initiative.
It is designed for farmers and producers who adopt reduced-input, residue- safe, and soil-friendly farming practices**,** ensuring safe food and fiber production while maintaining environmental and economic balance.

SAS Eco emphasizes:

- Rational and need-based use of synthetic inputs.
- Encouragement of organic and biological alternatives.
- Maintenance of **Maximum Residue Limits (MRLs)** as per SAS standards.
- Focus on soil health, biodiversity conservation, and water management.
- Traceable production systems for food safety assurance.

2. Objective

To promote safe, sustainable, and efficient farming through balanced input use and residue-controlled crop production that supports both farmer livelihood and consumer health.

3. Scope

SAS Eco is applicable to:

- Farmers and producer organizations cultivating crops under monitored residue control systems.
- Traders and buyers seeking sustainability-aligned sourcing with low chemical input footprints.

4. Definitions

Term	Definition
Maximum Residue Limit (MRL)	Maximum concentration of pesticide residues legally permitted in food or fiber.
Bio-inputs	Inputs derived from biological or natural materials (e.g., compost, biofertilizers, neem extract).
Synthetic Inputs	Manufactured fertilizers, pesticides, or growth promoters.
Audit	Verification activity conducted by authorized SAS personnel to ensure compliance.
Conversion	Process of transitioning from conventional to low-input sustainable production.

5. Conversion Period

The Conversion Period under SAS Eco refers to the time required for a farmer or producer to shift from conventional input-intensive cultivation to reduced-input, residue-safe production as per SAS Eco requirements. This period ensures that the field, crop, and farmer practices stabilize and comply with SAS Eco protocols before certification.

5.1 Conversion Period Requirement

a) Standard Conversion Period

- The conversion period for SAS Eco is one full cropping season (one harvest cycle).
- The farmer must follow SAS Eco input restrictions, recordkeeping rules, and audit requirements throughout this period.

b) Reason for Conversion Period

The conversion period allows:

- Reduction of chemical residues in soil and crop.

- Adjustment of farming practices to low-input / bio-based methods.
- Establishment of accurate recordkeeping.
- Consistent monitoring by SAS auditors.
- Ensuring produce meets residue safety levels before certification.

5.2 Conditions during Conversion Period

During the conversion period, the farmer must comply with:

1. Input Use Restrictions

- No use of banned pesticides or high-toxicity chemicals.
- Limited use of synthetic fertilizers only as per soil test.
- Only approved insecticides/herbicides under SAS Eco.
- Mandatory recording of all inputs in the Farm Diary.

2. Field Monitoring

- Minimum **two audits** (Sowing Audit + Harvest Audit).
- Internal inspection by field staff once every 30–45 days.
- Random residue sampling if risk is high.

3. Recordkeeping

The farmer must maintain:

- Farm Diary
- Purchase bills
- Soil and water test reports
- Training attendance
- Field Coordinator monthly log

Incomplete documentation will **extend** the conversion period.

5.3 Reduction or Extension of Conversion Period

a) Reduction of Conversion Period

The conversion period may be reduced to half-season if the following conditions are met:

1. The farmer demonstrates previous low-input farming or existing residue-safe history**.**
2. The field shows no residue detection in initial sampling.
3. Soil and water tests show no contamination.

The decision must be approved by the **SAS Certification Officer** and documented.

b) Extension of Conversion Period

Conversion period will be extended if:

- Residue tests show values above MRL
- Use of restricted chemical without approval
- Farm Diary found incomplete

- Critical non-compliance detected
- Deliberate concealment of chemical usage

Extension may range from 1 additional season to full re-registration, depending on severity.

5.4 Certification after Conversion Period

A farmer is certified SAS Eco only if:

- Both season (if applied for both) audits are completed.
- Residue test results meet MRL limits.
- No major non-compliance is pending.
- Records are complete for the entire season.

Once certified, the farmer receives:

- SAS Eco **Scope Certificate and Transaction Certificate.**
- Unique Farmer ID in SAS database

Certification remains valid for one agricultural season.

5.5 Special Cases

a) New Land / Untouched Soil

Newly cultivated land with no history of chemical use may be granted direct Certification after:

- Field inspection
- Soil and residue test
- Verification of farmer declaration

b) High-Risk Farmers

Farmers with:

- History of heavy pesticide use.
- Contaminated irrigation water
- Neighboring drift-risk
  may require additional sampling or extended conversion time.

6. Principles and Process of Production under SAS Eco

SAS Eco follows a stage-wise structure to ensure proper control of inputs and management practices throughout the crop cycle.

6.1 Land Preparation Stage

Objective: Build fertile, residue-safe, and biologically active soil before sowing.

Guidelines:

1. Conduct soil testing every season to determine nutrient and residue status.

2. Use organic matter such as compost, FYM, vermicompost, or green manure to enrich soil.
3. Incorporate crop residues instead of burning them.
4. Apply biofertilizers (Azotobacter, PSB, Rhizobium, etc.) to enhance microbial activity.
5. Limit synthetic fertilizers (e.g., DAP, NPK) to soil test-based doses only.
6. Avoid unapproved soil conditioners, chemical sterilants, or untreated industrial waste.
7. Adopt minimum tillage or conservation tillage to preserve soil structure.
8. Ensure bunding and contouring to prevent erosion.

6.2 Crop Sowing / Planting Stage

Objective: Establish healthy crops using clean, safe, and well-treated seeds.

Guidelines:

1. Use certified, non-GMO, and untreated seeds**.**
2. Prefer local or climate-resilient varieties for adaptation and reduced pest load.
3. Treat seeds with bio-fungicides like *Trichoderma*, *Pseudomonas*, or neem extract instead of chemical fungicides.
4. Only use synthetic seed treatment if approved and recorded in the Farm Diary, within safe limits.
5. Maintain proper spacing, raised bed planting, and intercropping for pest management.

6. Ensure irrigation water quality testing (TDS, heavy metals) before use.

6.3 Crop Management Stage

Objective: Maintain crop growth with minimal chemical input and integrated natural care.

6.3.1 Nutrient Management

1. Prioritize compost, vermicompost, and biofertilizers.
2. Use synthetic fertilizers only as per soil test report.
3. Foliar sprays of micronutrients must be based on deficiency symptoms and documented.
4. Avoid blanket fertilizer applications.

6.3.2 Pest and Insect Management

1. Prefer botanical extracts (neem, garlic-chili), bio-pesticides, and pheromone traps.
2. Chemical insecticides may be used only if pest threshold levels are crossed and with approval.
3. Ensure that the final residues remain below MRL levels.
4. Avoid insecticides or any banned/unregistered products.

6.3.3 Weed Management

1. Encourage manual/mechanical weeding, mulching, and intercropping.
2. Use herbicides only at label-recommended dose and under supervision.
3. Avoid pre-emergent or residual weedicides that persist in soil.

6.3.4 Disease Management

1. Use crop rotation, resistant varieties, and seed sanitation.
2. Apply Trichoderma or bio-control agents preventively.
3. Chemical fungicides only within MRL and with prior record in Farm Diary.

6.3.5 Irrigation and Water Use

1. Use clean, tested water for irrigation.
2. Encourage drip/sprinkler systems to reduce leaching.
3. Avoid wastewater or effluent irrigation.

6.4 Harvest Stage

Objective: Ensure clean, residue-safe produce through proper timing and handling.

Guidelines:

1. Use clean tools and avoid contamination with soil or untreated water.

2. Segregate produce from different fields to maintain traceability.
3. No harvesting before required withdrawal period after pesticide spray.
4. SAS auditors must conduct sampling during harvest for residue verification.

6.5 Storage Stage

Objective: Preserve the integrity of SAS Eco produce.

Guidelines:

1. Use clean, ventilated storage areas free of pest infestation.
2. Conduct fumigation only with botanical-based or approved natural agents.
3. Use food-grade bags or jute sacks, not chemical-contaminated materials.
4. Clearly label each lot with SAS farmer ID, audit number, and date.
5. Maintain a storage register for traceability and inspection.

6.6 Land Re-Preparation Stage

Objective: Restore soil and prepare sustainably for the next crop cycle.

Guidelines:

1. Incorporate crop residues or grow green manure/cover crops.
2. Apply compost, biochar, and microbial inoculants to rejuvenate soil.
3. Avoid residue build-up through periodic residue testing.
4. Rotate crops – cereals, legumes, and oilseeds – to maintain soil balance.
5. Avoid repetitive mono-cropping without soil improvement practices.

7. Record Keeping and Traceability

Every farmer must maintain:

- **Farm Diary** (Annexure 2) for input and activity logs.
- **Soil and residue test reports** (Annexure 3).
- **Audit compliance sheets** (Annexure 4).

These documents ensure transparency and verification during audits.

8. Audit and Verification Protocol

The SAS Eco audit process is designed to verify compliance with the reduced-input and residue-safe

farming standards. All audits follow the principles of impartiality, consistency, and documented verification.

1. **Two audits per season**:
    - Sowing audit (within one month of planting).
    - Harvest audit (at time of picking or threshing).
2. Random residue testing for at least 10% of lots**.**
3. Any deviation or emergency input use must be reported within 7 days**.**
4. Non-compliance leads to warning or suspension of SAS Eco certification.

8.1 Audit Stages under SAS Eco

Stage 1: Pre-Registration & Baseline Verification

- Farmer registration & profile creation.
- GPS mapping, land documentation.
- Soil health and water quality testing.
- Evaluation of past pesticide use.
- Residue risk classification (High/Medium/Low).

Stage 2: Sowing Audit (Early-Season Audit)

- Conducted within 0-30 days of sowing
- Verification of:
    - Land preparation practices.
    - Seed source and seed treatment.

  - Fertilizer and bio-input use.
  - Farm Diary first entries.
  - SAS Edge entries (plot, sowing date, inputs).
- Early identification of high-risk farmers.
- Mandatory for all SAS Eco farmers.

Stage 3: Mid-Season Audit (Crop Management Audit)

- Conducted between 30–70 days after sowing (depending on crop)
- Verification of:
  - Input use (type, dose per ha, spray interval).
  - Pest, weed, and disease management.
  - Neighbor drift or high-risk zones.
  - Updated Farm Diary.
  - Internal inspector monthly logs.
  - Potential residue risk triggers.

Stage 4: Harvest Audit

- Conducted at harvest / picking / threshing
- Verification of:
  - PHI (Pre-Harvest Interval) compliance.
  - Produce lot creation.
  - Tool hygiene.
  - Storage hygiene.
  - Sample collection for residue testing.
  - Final traceability.
  - Yield assessment.
- Mandatory for all SAS Eco farmers.

8.2 Types of Audits

1. Initial Audit (Full System Assessment)

Assesses:

- Entire resource management system.
- Baseline input use.
- Environmental risk.
- Recordkeeping and traceability.
- Internal supervision system.

Outcome → Approval to enter Conversion Period.

2. Surveillance Audit (Annual Audit)

Conducted once every 12 months.
Checks:

- Ongoing practice compliance.
- Input purchase and its usage verification.
- PHI records.
- Random residue samples.
- Farm Diary scrutiny.

3. Environmental Impact Verification Audit

Conducted **once every 2 years**.
Assesses:

- Soil health improvement.
- Water management.

- Biodiversity and ecological impact.
- Reduction in synthetic input dependency.

4. Mandatory Annual Cycle Audits

Minimum two audits must occur each year:

- Sowing Audit
- Harvest Audit

5. Triggered / Unannounced Audits

Triggered by:

- High-risk chemical use
- Unusual yield or input pattern
- Previous NC / MRL failure
- Complaints or risk alerts

8.3 SAS Edge Software Entries Required for Audits

SAS Eco requires digital traceability through **SAS Edge**.

Below are mandatory entries:

A. Pre-Season / Registration Entries

- Farmer profile
- Land details (Survey No., GPS, area)
- Soil test upload
- Water test upload
- Risk category selection

B. Sowing Stage Entries

- Sowing date
- Seed details (variety, source, treated/untreated)
- Land preparation details
- Basal inputs used (quantity per ha)
- First Farm Diary upload

C. Mid-Season Entries

- All inputs used (chemical/bio)
- Dose per hectare (mandatory)
- Spray details (date, quantity, area)
- Pest/disease observations
- Internal inspection report
- Photographs of field condition

D. Harvest Stage Entries

- Harvest date
- Harvest lot creation
- Yield estimate vs. actual harvest
- Residue sample status
- Storage details
- Final Farm Diary upload

E. Post-Audit

- Auditor report
- NC classification
- CAPA details
- Approval / Rejection decision

8.4 SAS Eco Audit Process Flow

Step 1: Farmer Registration → SAS Edge entry completed
Step 2: Baseline Assessment → Soil/Water test verification
Step 3: Sowing Audit → Field inspection + input verification
Step 4: Mid-Season Audit → During vegetative stage
Step 5: Harvest Audit → Lot verification + residue sampling
Step 6: Lab analysis → Residue report fetched in SAS Edge
Step 7: Auditor Decision → Pass / Fail
Step 8: NC raised (if applicable) → CAPA required
Step 9: Certificate Issue → SAS Eco Scope Certificate
Step 10: Annual Surveillance → Every 12 months
Step 11: Environmental Impact Audit → Every 2 years

8.5 NC (Non-Conformity) Classification

1. Minor NC

Small deviations that do not affect product integrity
Examples:

- Missing Farm Diary entries
- Delay in internal inspection
- Incorrect spacing or agronomic practice
  Action:
  Correction within **7 days**.

2. Major NC

Deviation with potential impact on product safety or sustainability
Examples:

- Use of restricted pesticide without approval
- Incorrect dose beyond recommended limit
- PHI not documented
- Mixing of lots
  Action:
  Immediate corrective action + re-inspection.

3. Critical NC

Direct impact on product safety, integrity, or traceability
Examples:

- Use of banned/illegal pesticide
- Residue test failure (above MRL)
- Falsification of input records
- Concealment of chemical use
  Action:
- Immediate suspension

- Lot rejection
- Farmer de-listing for the season

8.6 CAPA (Corrective Action & Preventive Action) Requirements

Each NC must be closed with a documented CAPA involving:

1. Root cause
2. Corrective action taken
3. Preventive action planned
4. Re-inspection confirmation
5. SAS Edge CAPA upload

8.7 Certification Decision Rules

Certification is granted only if:

- All mandatory audits completed
- No major NC pending
- All corrective actions closed
- Residue results meet MRL limits
- SAS Edge records complete

Certificate validity:

One season / one harvest cycle

8.8 Residue Sampling Protocol

8.8.1 Minimum Sampling Requirement

- 10% of all farmers must be sampled each season.
- Additional samples required if:
  - Previous season had non-compliance
  - High input use detected
  - Risk from neighboring fields is high

8.8.2 Sample Collection Method

- Done **only by SAS auditor or authorized sampler**
- Sample size: **1 kg composite sample**
- Sampling recorded in the **Field Sampling Sheet**

8.8.3 Laboratory Requirements

- Testing must be conducted in **ISO/IEC 17025 accredited labs**
- Tests must include:
  - Pesticide residues
  - Heavy metals
  - Nitrates (for leafy/vegetable crops)

8.8.4 Decision Rules

- If residues are **below MRL** → Farmer passes
- If residues are **above MRL** →
  - Farmer is marked **Non-Compliant**

- Lot is rejected
- CAPA required (Corrective Action & Preventive Action)
- Farmer's certification suspended for the season

8.9 Verification Requirements

During every audit, the auditor must verify:

Mandatory Documents

1. **Farm Diary** (complete entries with dates, inputs, doses, area)
2. **Input purchase bills**
3. **Soil test reports**
4. **Water quality tests**
5. **Residue test reports**
6. **Field Coordinator Monthly Log**
7. **Farmer Registration Form**
8. **Training attendance sheet**

Optional (if applicable)

- Irrigation logbook
- Previous year corrective actions
- Pheromone trap installation record

8.10 Risk Assessment

Objective: To identify, evaluate, and control potential risks that may affect ecosystem sustainability, environmental quality, biodiversity, resource efficiency, worker safety, and traceability under the SAS Eco Standard. The purpose is to ensure that high-risk areas receive intensive monitoring, additional audits, and corrective action to protect ecological integrity.

Scope: This Risk Assessment applies to all SAS Eco-registered operators, including individual farms, grower groups, ecosystem units, and community-managed landscapes. It covers ecological, environmental, social, and compliance-related risks that impact SAS Eco certification.

1. Risk Identification

Risks must be assessed across **five main categories** relevant to SAS Eco:

A. Environmental & Ecological Risks

- Soil degradation, erosion, nutrient depletion
- Water contamination, excessive groundwater extraction
- Loss of biodiversity, habitat disturbance

- Deforestation or disturbance of natural ecosystems
- Mismanagement of waste, chemicals, or effluents

B. Production & Resource Use Risks

- Excessive agrochemical dependency
- Unsustainable irrigation practices or water stress
- Poor soil management, low organic matter
- Lack of crop rotation or monocropping
- Inefficient nutrient, pest, and disease management

C. Climate & Natural Hazard Risks

- Drought, flood, cyclone, extreme temperature
- Climate-driven pest or disease outbreaks
- Vulnerability of farms adjoining sensitive ecosystems

D. Worker Safety & Social Risks

- Exposure to hazardous inputs
- Lack of PPE during spraying or equipment handling
- Water source conflicts
- Unsafe storage of chemicals

E. Compliance & Traceability Risks

- Non-compliance with SAS Eco principles
- Weak documentation or incomplete field records
- Traceability gaps at field, group, or storage level
- Incorrect mapping of ecological zones

2. Risk Assessment & Scoring

Score Type Scale

Likelihood 1 (Rare) → 5 (Almost Certain)
Impact 1 (Low) → 5 (Severe/Ecologically Harmful)
Risk Score Likelihood × Impact
Risk Level 1-5 Low, 6-12 Medium, 15-25 High

Note: Any risk with potential to cause soil erosion, biodiversity loss, water contamination, or ecosystem damage shall be treated as High Risk, even if numerical scoring is borderline.

3. Risk Mitigation

Mitigation actions must reflect the ecological priorities of SAS Eco:

High Risk

- Immediate corrective action
- Soil & water conservation structures
- Biodiversity restoration (native species, hedgerows)
- Strict monitoring and additional audits
- Chemical reduction plans / safe handling verification

Medium Risk

- Improved nutrient & water management
- Crop rotation, mulching, integrated pest management (IPM)
- Documentation strengthening
- Field-level ecological training

Low Risk

- Routine monitoring
- Continued adherence to SAS Eco practices
- Periodic training and awareness

Examples of Mitigation Measures:

- Soil and water testing
- Contour bunding, cover cropping, mulching
- Proper chemical storage & PPE training
- Strengthening traceability and internal control systems

4. Monitoring & Follow-Up

Monitoring frequency and sampling under SAS Eco must follow both group-size sampling rules and ecological risk sensitivity.

Group Size–Based Minimum Sampling (for Grower Groups)

Group Size (Farmers)	Minimum Sampling %
25–100 farmers	20%
101–300 farmers	15%
301–500 farmers	10%

Ecological Priority Sampling (Mandatory for SAS Eco)

The following must always be included in sampling, irrespective of percentages:

- High-risk farmers or plots
- Areas near water bodies, forests, or biodiversity-rich zones
- Farms with chemical-use history
- Erosion-prone slopes or sensitive landscapes
- Fields bordering conventional chemical-using farms
- Plots undergoing eco-restoration

Monitoring Actions

- Verify implementation of mitigation measures
- Inspect biodiversity protection measures
- Validate soil and water conservation structures
- Check chemical storage, PPE use, and worker safety
- Ensure proper eco-mapping and traceability entries in **SAS Edge**

All risks, mitigation actions, and follow-up remarks must be documented.

5. Documentation Requirements

a. Eco-Risk Register

A consolidated summary of:

- Identified risks
- Ecological classification
- Likelihood/Impact scoring

- Mitigation plans
- Follow-up status

b. Plot-Level Risk Logs

Mandatory for:

- High-risk plots
- Chemical history plots
- Sensitive ecosystem areas (waterbodies, slopes, biodiversity patches)

c. Audit Trail in SAS Edge

Auditors must upload:

- Risk scores
- Sampling rationale
- Evidence of mitigation
- CAPA status
- Field photos / maps / traceability records

Annexures

Annexure I: Allowed and Restricted Inputs

Input Category	Allowed	Restricted (under supervision)	Prohibited
Fertilizers	Compost, FYM, biofertilizers	Urea, DAP, NPK (based on soil test)	Unregistered chemical mixtures
Pesticides/Insecticides	Neem oil, *Beauveriabassiana*, pheromone traps	Approved insecticides below MRL	banned products
Fungicides	*Trichoderma*, cow urine solution	Mancozeb, copper oxychloride (within limits)	Carbendazim, thiram, banned fungicides
Herbicides/Weedicides	Manual/mechanical control	Glyphosate at label dose (under approval)	Paraquat, Atrazine (non-selective)
Fumigants	Neem leaves, camphor	Phosphine within MRL	Methyl bromide
Growth Regulators	Seaweed, amino acid	GA_3 within prescribed	Synthetic hormones
	foliar sprays	dose	

Annexure II: Farm Diary Format

Date	Activity	Input Used	Quantity	Remarks

(To be maintained daily and verified during audits.)

Annexure III: Sample Lab Test Report Format

Parameter	Observed Value	Permissible Limit	Result
Pesticide Residues			
Heavy Metals			
Nitrates			

(Issued by accredited laboratories; results must meet permissible limits.)

Annexure IV: Audit Checklist

Audit Stage	Verification Points
Sowing	1. Seed source 2. Input purchase records 3. Initial field inspection
Mid-Season	1. Input logs 2. Pest & weed management 3. IPM compliance
Harvest	1. Residue sampling 2. Yield record verification 3. Traceability check

Annexure V: MRL Values

S.No	Pesticide	Crop	MRL (mg/kg)
1	Imidacloprid	Cotton	2.0
2	Acetamiprid	Cotton	1.0
3	Lambda-cyhalothrin	Cotton	0.5
4	Cypermethrin	Cotton	0.5
5	Profenofos	Cotton	5.0
6	Chlorpyrifos	Cotton	0.2
7	Pendimethalin	All food crops	0.05
8	Carbendazim	Vegetables	0.5
9	Mancozeb	Vegetables	0.2
10	Metalaxyl	Vegetables	1.0
11	Glyphosate	Pulses	0.1
12	Paraquat	Cereals	0.05
13	Neem extract (AZA)	All crops	Exempt
14	Beauveria / Metarhizium	All crops	Exempt
15	Trichoderma	All crops	Exempt

A. Crop specific –MRL Values

1. Cotton

Pesticide	Crop	MRL (mg/kg)
Imidacloprid	Cotton seed	**2.0**
Acetamiprid	Cotton seed	**0.9**
Lambda-cyhalothrin	Cotton seed	**0.5**
Cypermethrin	Cotton seed	**0.5**
Deltamethrin	Cotton seed	**0.2**
Profenofos	Cotton seed	**5.0**
Chlorpyrifos	Cotton seed	**0.5**
Thiamethoxam	Cotton seed	**0.5**
Diafenthiuron	Cotton seed	**0.2**
Spinosad	Cotton seed	**0.02**

2. Cereals (Wheat, Rice, Maize)

Pesticide	Crop	MRL (mg/kg)
Imidacloprid	Wheat grain	**0.05**
Acetamiprid	Wheat grain	**0.02**
Chlorpyrifos	Wheat grain	**0.01**
Lambda-cyhalothrin	Wheat grain	**0.02**
Cypermethrin	Wheat grain	**0.2**
Deltamethrin	Wheat grain	**1.0**
Malathion	Wheat grain	**10.0**
Fenitrothion	Wheat grain	**10.0**
Carbaryl	Wheat grain	**0.5**
Pirimiphos-methyl	Wheat grain	**7.0**

3. Pulses (Chickpea, Lentil, Pigeon Pea)

Pesticide	Crop	MRL (mg/kg)
Imidacloprid	Beans (dry)	**0.05**
Acetamiprid	Beans (dry)	**0.2**
Chlorpyrifos	Beans (dry)	**0.05**
Cypermethrin	Beans (dry)	**0.2**
Lambda-cyhalothrin	Beans (dry)	**0.02**
Deltamethrin	Beans (dry)	**1.0**
Malathion	Beans (dry)	**10.0**
Fenitrothion	Beans (dry)	**3.0**

B. Fungicides – MRL Values

1. Vegetables (Tomato, Brinjal, Okra, Chili)

Fungicide	Commodity	MRL (mg/kg)
Mancozeb	Tomato	**2.0**
Metalaxyl	Tomato	**1.0**
Cyprodinil	Tomato	**1.0**
Dimethomorph	Tomato	**1.0**
Azoxystrobin	Fruiting vegetables	**1.0**
Propiconazole	Fruiting vegetables	**0.3**
Chlorothalonil	Tomato	**2.0**
Captan	Fruiting vegetables	**5.0**
Carbendazim	Fruiting vegetables	**0.2**

2. Onion / Root Vegetables

Fungicide	Commodity	MRL
Mancozeb	Onion	**1.0**
Metalaxyl	Onion	**0.2**
Azoxystrobin	Onion	**1.0**
Propiconazole	Onion	**0.1**

C. Herbicides – MRL Values

Herbicide	Commodity	MRL (mg/kg)
Glyphosate	Pulses (dry beans)	**2.0**
Glyphosate	Maize grain	**5.0**
Glyphosate	Wheat	**5.0**
Paraquat	Cereal grains	**0.05**
Pendimethalin	Vegetables	**0.05**
2,4-D	Cereal grains	**2.0**

Annexure: SAS Eco – Risk Assessment

S. No.	Risk Category	Description of Risk	Likelihood (1–5)	Impact (1–5)	Risk Score (L×I)	Risk Level	Mitigation Action	Follow-up / Status
1	Environmental & Ecological	Soil erosion, nutrient loss, water contamination, habitat disturbance					Soil & water conservation, mulching, contour bunds, vegetative barriers	
2	Biodiversity	Decline in beneficial insects, loss of native species, disturbance to habitats					Plant native species, establish hedgerows, reduce chemical exposure	
3	Resource Use (Water, Soil, Inputs)	Overuse of water, poor irrigation, nutrient imbalance, waste mismanagement					Water-use efficiency plan, composting, drip irrigation, safe disposal	
4	Climate & Natural Hazards	Drought/flood risk, climate-driven pest outbreaks					Climate-resilient practices, drought-tolerant varieties, IPM	
5	Worker Safety & Social	Exposure to chemicals, lack of PPE, hazardous storage					PPE provision, chemical safety training, safe storage areas	
6	Compliance & Traceability	Missing records, incorrect mapping, traceability gaps					Recordkeeping training, mapping and verification	

S. No.	Risk Category	Description of Risk	Likelihood (1–5)	Impact (1–5)	Risk Score (L×I)	Risk Level	Mitigation Action	Follow-up / Status
7	Chemical Use Risk (SAS Eco-Specific)	High dependence on fertilizers/pesticides affecting ecosystem health					Reduced chemical plan, correct dosage training, safe storage	
8	Sensitive Ecosystem Zone Risk	Farms near rivers, forests, wetlands, slopes					Mandatory sampling, eco-restoration, buffer creation	