Solution:

Holistic solutions for aflatoxin management in Asia and sub-Saharan Africa

Submitter: (ICRISAT)

Solution Overview

What is it, and what problem does it solve? Brief 2–3 sentence description.

Aflatoxins are natural toxic substances produced by the Aspergillus flavus group fungi, i.e., A. flavus and A. parasiticus. Aflatoxins contaminate a wide range of crops, including maize, groundnuts, sorghum, pearl millet, chili, peppers, cassava, as well as milk from animals fed contaminated feed in Sub-Saharan Africa (SSA) and Asia. ICRISAT has achieved success in developing Good Agricultural Practices (GAPs) for mitigating aflatoxin during both pre- and post-harvest stages. We have successfully demonstrated the efficacy of interventions aimed at reducing plant stress, resulting in a significant reduction in contamination.

Key Features & Benefits

Main components and why it is useful? Bullet points summarizing methods, tools, and value added.

Aflatoxin contamination is a complex problem, and no single solution can effectively eliminate the issue during pre- and post-harvest stages. Hence, ICRISAT has developed a package of science-backed solutions that can be scaled up.

- Promoting drought-tolerant and short-duration groundnut varieties that escape end-of-season drought. End-of-season drought (terminal moisture stress) is an important predisposing factor for aflatoxin contamination.
- Adjusting planting dates and following moisture conservation techniques
- Applying Gypsum (Calcium Sulphate) at the time of flowering to enhance shell integrity in pods and minimize A. flavus fungus penetration and infestation
- Avoiding or minimizing continuous mono-cropping of groundnut under rainfed conditions, especially in high aflatoxin risk areas
- Avoiding long-term contact of groundnut pods with soil after harvest
- Drying of groundnut pods on tarpaulin sheets rather than on bare ground
- Drying to a level of less than 10% moisture before bagging the pods
- Storage in hermetic bags
- Deploying low-cost aflatoxin detection technologies for continuous monitoring of aflatoxin contamination along the value chains

Where It Works and Where It Can Work

Existing and potential target regions, agroecologies, or farming systems. Include examples if available.

All groundnut-growing areas in Asia (India, Bangladesh, Vietnam, Myanmar, Laos, etc.) and sub-Saharan Africa (Malawi, Zimbabwe, Kenya, Nigeria, Niger, Mali, Senegal, Sudan, etc.)

Evidence & Impact

What results has it shown? Stats, pilot outcomes, or testimonials.

ICRISAT has successfully demonstrated in farmers' fields that a set of good agricultural practices (GAPs) effectively reduced pre-harvest aflatoxin contamination. Kernel infections and aflatoxins were significantly lower, with reductions of 13–58% and 62–94%, respectively, in GAPs plots compared to farmer practices (FP). An average US$58 per ha net gain was realized through the adoption of GAPs by farmers, besides quality improvement of groundnuts.

Scalability & Adoption Support

Why it can be scaled and what's needed to adopt it? Low-cost, adaptable, partner-ready, etc.

The good agricultural practices that we tested and promoted are cost-effective and easily adoptable by small and marginal farmers. Sensitizing the farmers and linking them to markets after producing quality groundnuts is key.

Contact Info

For key contacts and more information on scaling this solution, please email: contact.issca@icrisat.org
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