

## **Innovative SPS Solutions for the Control of Yeasts & Moulds and Mycotoxins in Chilli (Spices)– OFAGNET™ (Patent Pending) – by Vithal PSRVS (SFSAS)**

1. SPICE INDUSTRY CHALLENGE: Mycotoxins (\*Aflatoxins/Ochratoxin) and Microbial (\*Salmonella) Contamination in Indian Chilli/Spices hampering the exports. Thorough investigation and research, the major root cause(s) of this contamination identified are due to existing drying & harvesting methods.

2. DISRUPTIVE INNOVATION:

2.1 Root cause identification: Five Root causes resulting in high Yeasts/Moulds (CFU/gram) contamination and Mycotoxins. (1) Contact of chilli with ground/soil(microorganisms) during drying & pod damage during turning/grading/bulking (2) No circulation of air through the chilli bed (3) Moisture reabsorption by chilli fruit during night (4) Extended drying period & (5) the harvesting decisions/habits of farmers.

2.2 Solution: includes (1) Elimination of contact with ground/soil(microorganisms) and no mechanical damage during turning/grading/bulking (2) Circulation of air on bottom/top surfaces and through the chilli bed (3) Limiting moisture absorption during night, (4) reducing the drying period & (5) Ripe Chilli fruit harvest.

2.3 Innovation: An innovative solution OFAGNET™[One Foot Above Ground Net] was designed to address these causes. Research was done on Chilli farms (Guntur District, Andhra Pradesh) during 2017/2018 and introduced this system to the farmers.

This OFAGNET™ system is based on Thermodynamic Principle i.e. Effective utilization of natural Sun energy & natural draught of Air from the bottom of the commodity bed placed on nets.

2.4 Brief description of the innovation:

2.4.1 OFAGNET™-SADOS: The system using direct sun light and wind draught, to dry chillies is called SADOS (Sun Air Drying Open System). SADOS System is based on thermodynamic principle of utilization of temperature gradient i.e. the top vs. bottom surfaces of the chilli bed placed on OFAGNET™. During nights, this system is protected from moisture reabsorption by covering with tarpaulin. This sub system again having two types (A1, A2) basis the agri commodity being dried.

2.4.2 OFAGNET™-HADCS: Another system HADCS (Hot Air Drying Chamber System) is based on the thermodynamic principle of utilization of temperature gradient of ambient air vs. the temperature in the OFAGNET™ hot air drying chamber. This sub-system day and night covered by tarpaulin placed on net to create a closed chamber over A1/A2.

3. RESULTS OF OFAGNET™ DRYING SYSTEMS - CHILLI \*\*:

3.1 YEASTS & MOULDS (CFU/gm) (a) Traditional system:- 99,000-100,000 (b) OFAGNET™: 300-2100

3.2 AFLATOXINS (a) Traditional System: > MRL (b) OFAGNET™ systems: NIL

3.3 DRYING PERIOD (days): (a) Traditional system: 15-21 (b) OFAGNET™ SADOS: 7-12 (c) OFAGNET™ HADCS: 7-8.

3.4 RISK OF MOISTURE REABSORPTION: OFAGNET™ Systems: NIL/Negligible

#### 4 BENEFITS:

4.1 OFAGNET™ drying system is Cost Effective, Easily Accessible, and a Sustainable way towards achieving high food safety standards in Spices [SPS solutions].

4.2 This OFAG Net dried Chilli/Spices commodity is of superior Quality than the traditionally dried product and it is safe & hygienic to consumers, fetches better returns to all stake holders in the supply & Value chain and strengthens Indian Spice Industry.

\*Reference in PPT

\*\* Details in PPT