FOOD SECURITY FOR THE SAHEL

Technologies for African Agricultural Transformation – TAAT

West African Technology Fair (WATEF)

"Mainstreaming Technology for Agricultural development"

Hotel …. Dakar

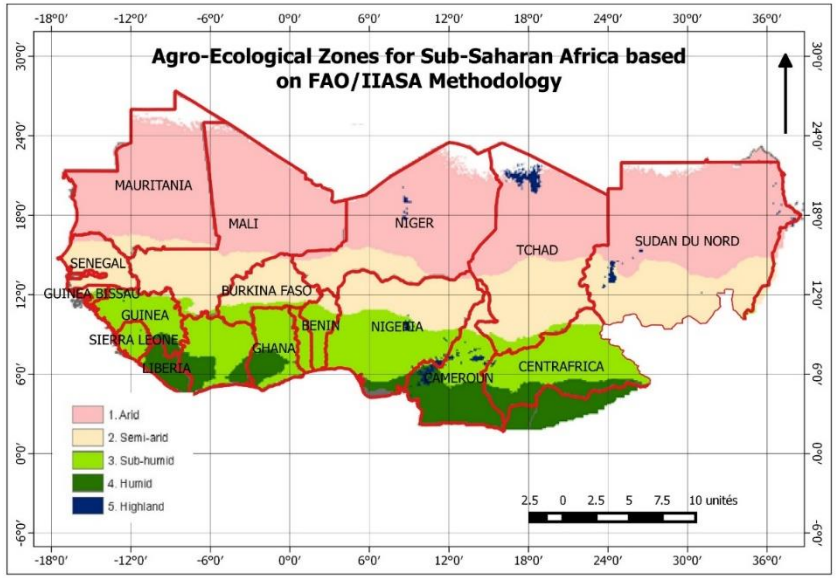
25th – 29th October 2021

Sorghum and Millet Compact

The Compact team

TAAT's Sorghum and Millet Compact (S&MC)

Pearl millet and sorghum are the main staple food crops especially in Sahelian countries with 80% of cultivated area and more than 49% of food consumption needs.



Overall Objective:

Improve food security and the livelihoods of farming families through sustainable intensification and better profitability of both crops.

TAAT's Sorghum and Millet Compact (S&MC)

S&MC works through Innovation Platforms in 7 countries to:

- Enhance seed sector through best genotypes and "best-bet" nutrients, water management with GAPs and IPM options;
- Build farmers capacities with proven technologies;

✓ **Overcome the challenge of low productivity and production and Increase value chain efficiency through the reduction of post-harvest losses, Increased product quality, aggregation, traceability and transformation in sorghum and millet value chains.**

TAAT's Sorghum and Millet Compact (S&MC) & Enabler Compacts

Soil Fertility and Water Enabler Compacts in countries where both compacts intervene

- ✓ For awerness raising around demonstration plots
- ✓ Field days

Partnerships developed in S&M Compact

More than 100 Delivery partners in RMCs

Seed companies:

Burkina Faso: AGRISSEM
Chad: FNOPS

Mali: SOPROSA, COPROSEM FASO KABA, Comptoir 2000, DUNKAFA, CAMARA SEMENCE

Niger: ALHERI Seed Company, Entreprise Hala, Entreprise Amate

Nigeria: Green Spore, Maina, Rahama Seeds

Senegal: RESOPP

Sudan: ASSCO

Agro-input dealers:

Burkina Faso: FAGRI, AGRODIA

Mali: FASO KABA

Niger: CAIMA, Manoma,

Nigeria: NOWAIDA

Sudan: MASCO, CTC Group

State institutions, Extension services & NGOs:

Burkina Faso: DPA/ZONDOMA

Chad: ANADER, DSP, DPA

Mali: DNA, EUCORD

Niger: DDA, CRS

Nigeria: FMARD, NBS, State ADPs

Senegal: CARITAS Tambacounda

Sudan: MPER, SoS-NGO, MAS, SMoPER

Commercialization & Finance institutions:

Burkina Faso: UGCPA

Mali: AMASSA

Senegal: Mamelle Jaboot, GIE, RESOPP

Nigeria: Ahalson Nig. Ltd.

Sudan: CTC Group, MASCO, ABS, SICO-GB

Processors:

Burkina Faso: UTCF

Mali: Grand Moulin du Mali, Keitala Negoce, M3

Nigeria: Ali Ahalson Nigeria Ltd.

Senegal: RESOPP, GIE

Sudan: Sayga Flour Mills

Farmer organizations:

Burkina Faso: FEPA-B, UPPA, AMSP

Chad: CNCPRT

Mali: Union Nieta Bla, ULPC, USCPCD

Niger: Fuma GASKYA, MORIBEN

Nigeria: Sate ADPs (Kano, Katsina, Jigawa, Sokoto, Gombe, Bauchi)

Senegal: RESOPP, AGROPROV, PENCUM BAMBUK, BAMTARE, GIE (women)

Sudan: FBOs, CPFO, WG

Achievements of the S&M Compact - Enhanced partnership

Boosting seed sector - Put the genetic potential in the hands of the farmers

Breeder seeds:
Sorghum: 8.58 t
Millet: 4.04 t

← National Research institutions in RMCs

Foundation seeds:
Sorghum: 261 t
Millet: 157 t

← National Research institutions & Seed companies

Seed companies & Farmers seed growers →

Certified seeds:
Sorghum: 1,448 t
Millet: 828 t

Achievements of the S&M Compact

Boosting crop production - Capacity building, production & linking farmers to markets

Training in

Improved skills in agriculture enterprises development: **12,657**

Men: 7,079 (44%)

Women: 3,168 (25%)

Youth: 2,410 (19%)

Trained & Using

Improved post-harvest technologies : **5,072**

Men: 3,181 (63%)

Women: 1,891 (37%)

Link to input and output markets:

Access facilitated for : 51,442 farmers and primary processors

Direct beneficiaries:

483,219 of which

46.5% are women

Bio-fortified Millet

CHAKTI

Biofortified (High Fe (60 ppm) & Zn (65 ppm), high yielding (1.5 t/ha) and early maturing (65 days)

Released in 2018

ICRI-Tabi

Biofortified (High Fe (45 ppm) & Zn (43 ppm), high yielding (1.5 t/ha) and early maturing (80 days)

Released in 2018

Bio-fortified Sorghum

	Protein (%MS)	Fe (ppm)	Zn (ppm)	Note
Jakunbe	15	66	37	High Proteins, Fe & Zn
Jiguikala	15	71	35	High Proteins, Fe & Zn
Soumba	15	79	32	High Proteins, Fe & Zn
Fambé B	12	65	30	High Fe & Zinc

← Pop Sorghum

Sorghum cookies →

Dual purpose Millet

167003

167005

167006

- **High yielding,**
- **Good stover quality .**

Genotype	Grain Yield (t/ha)	Stover Yield (t/ha)	Metabolisable energy (mj / kg)	In Vitro digestibility (%)
ICMH 177111	2.5	5.5	6.4	49
ICMV 167005	1.8	5.1	7.9	53
ICMV 167006	1.7	4.2	7.5	51

Dual purpose Sorghum

Genotype	Targeted zone (mm)	Maturity (day)	Grain yield (t/ha)	Stover yield (t/ha)	Other characteristics
Seguifa	400-800	90	3	7	Tolerant to Drought, striga, ***In vitro digestibility (47%)***
Soubatimi	600-1000	105	3	10	***Sweet and juicy stem***, tolerant to striga, ***In vitro digestibility (49%)***
ICSV 1049	600-1000	110	4	8	Tolerant to Drought, striga
Tiandougou-coura	800-1200	125	2.5	10	Tolerant to striga, ***In vitro digestibility (49%)***
Jiguikala	600-1000	110	2.5	9	***Rich in iron, zinc and proteins, In vitro digestibility (50%)***
Sassilon	800-1200	120	4	12	Hybrid-high yield

Organic and mineral Fertilizer microdose

Advantage:

1. Concentration of nutrients in the rooting zone
2. Enhance crop root development. All this leading to improved water and nutrient use and better year (more than 100%)
3. Reduce the quantity of fertilizer applied

Organic and mineral Fertilizer microdose – mechanized application

Parasitoid wasp release for biological control of Head Miner & Fall Army Worm

1. The millet head miner (MHM)/spike worm, *Heliocheilus albipunctella* (de Joannis) (Lepidoptera: Noctuidae) ➔ The immature larval feed on panicle which prevent grain formation
2. The Fall Army Worm (FAW), *Spodoptera frugiperda* (J.E. Smith) (Lepidoptera: Noctuidae), a pest native to the Americas ➔ Damage to maize and sorghum are done on the vegetative part of the crop

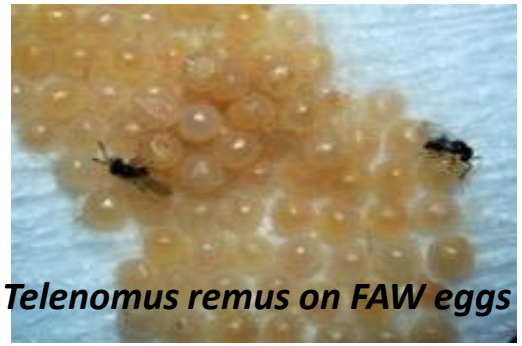
Parasitoid wasp release for biological control of Head Miner & Fall Army Worm

Biological control:

1. Millet head miner: Parasitoid Wasp ***Habrobracon*** (***Bracon***) ***hebetor*** Say (Hymeoptera: Braconidae)

2. Maize, Millet and Sorghum leave and stover: Egg parasitoid (*Telenomus remus* Nixon), the most promising biological control agent

Bracon on head miner eggs



Telenomus remus on FAW eggs

Mobile chopper to efficient use of crop residues

Animals selectively eat leafy parts sorghum and millet residues, leaving thick stem ➔ 20%-30% utilization by ruminant livestock

- The chopper is meant to chop the green stover or to crush the dry one ➔ **reduced wastage and provide options for critical dry and wet season animal feeding**.
- Intensification of crop-livestock integration (Useful for both cereal and animal productivity)

- **Performance:** Depending on the Model, the machine has a capacity of 1,000 to 1,500 kg/hr

- The chopper/crusher machines are locally fabricated except the engines, which are imported

Partnership engagement

I. Private Sector engagement or opportunity
   - ✓ Seed sector:
   - ✓ Input provider
   - ✓ Farmer organizations

II. Extension agencies or Development
   - ✓ Country extension staff:
   - ✓ National and international development organizations

III. Youth engagement opportunities (actual or potential)

Brokerage

I. How does one access the technology ?

- ✓ Bio-fortified varieties → ICRISAT & Partners
- ✓ Dual-purpose varieties → ICRISAT & Partners
- ✓ Organic and mineral fertilizer microdose → ICRISAT, IER, INRAN, IFDC
- ✓ Parasitoid for biological control → ICRISAT & Partners
- ✓ Small machines – Stover chopper → ICRISAT, ILRI & Parners

II. Make linkage to demonstration items in Booth or Video

- ✓ Sorghum and millet varieties available on the booth
- ✓ Chopper and hammer mills

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Conclusion & Recommendations

- ✓ Effort have been deployed leading to considerable achievements
- ✓ In the **Seed sector** ➔ proven technologies exist to help boost the productivity of both crops especially of effort is made to strengthen the capacity of individual producers as well as the companies involved

- ✓ **Input providers** ➔ Farmers must have the input at their door steps to lift the constraint easy access and steady control of the quality of input provided to farmer is done

- ✓ All the technologies presented are accessible and can be deployed on request

- ✓ Technical support is key in the success in deploying technologies and can also be provided by our team on request

ICRISAT
INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS

TAAT
Technologies for African Agricultural Transformation

Merci

Thank You