



Rice, Maize and Chickpea IPM for East Africa

On-farm verification and demonstration of integrated wilt/ root rot and pod borer management method on chickpea in East Shewa Zone.

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Background

- **Ethiopia shares 2% among most producer and about 46% in Africa.**
- **In Ethiopia average chickpea yield is below 2t/ha although its' potential yield is more than 5t/ha.**
- **The productivity was declined because of:**
 - ❖ **Abiotic factors: Terminal drought and heat**
 - ❖ **Biotic factors: Diseases and Insect pests**

Major chickpea diseases



Chickpea Diseases and Their Economic Importance

Diseases	Pathogen	Yield loss	Status
Wilt root rot	<i>Fusarium oxysporum</i> f.sp. <i>ciceris</i>	20-100	Major
Dry root rot	<i>Rhizoctonia bataticola</i>	5-50	Major
Ascochyta Blight	<i>Ascochyta rabiei</i>	50-70	Major
Collar root rot	<i>Sclerotium rolfsii</i>	15	Minor

Insect Pests



Objective: Verify and develop on farm integrated management of chickpea wilt/ root rot and on yield and yield component

Location: East Shewa Zone, Ethiopia (Adea and Lume Worede's).

Duration: Three years

Methodology

- **The verification experiment were conducted in Adea and Lume districts.**
- **The experiment was laid out as a factorial combination a farmers field was used as replication with 10mX10m plot sizes.**
- **The integrated WRR management package were consist of:**
- **Tolerant varieties (Arerti and Habru), seed treatment with fungicides (42WS% Apron Star at rate of 2g (a.i) kg/seed) and seed-bed preparation (ridge and flat).**

Methodology cont...

- In each districts there were three verification per sites.**
- The pod borer management was consist of timely insecticide application (lambda cyhalothrin).**
- Farmers were invited to evaluate the trial at seedling establishment, beginning of flowering and pod filling stages.**

Result and Discussion

- **Variety by seed bed type and seed treatment combination showed statistically significant variations ($p < 0.01$) for wilt/root rot, pod per plant, hundreds seed weight and yields (Table 1).**
- **The wilt/root rot incidence was reduced with combination of variety, raised bed by seed treatment.**
- **The lowest WRR (10.7 and 12.5%) were recorded on variety Arerti + raised bed with seed treated followed by Habru + raised bed with seed treatment respectively.**

Result and Discussion...

- The severe incidence of wilt/root rot (22.5%) was revealed on variety Arerti + flat bed type with non treated seed by fungicides followed by Habru.**
- Highest pod per plant (73.2) was displayed on variety Habru by raised bed with seed treatment.**
- Where as, highest yield (2250 kg) were observed on variety Habru with raised bed and followed by Arerti.**

Result and Discussion...

- **However, there was non-significant treatment effect on Biomass.**
- **All trait were Positively correlated to WRR except Biomass yield.**
- **In most waterlogging area delay planting expose the chickpea to terminal drought.**
- **Enthought the treatment effects was significant effects on the yield was low due to terminal drought.**

Table 1: Combined mean summary of five traits recorded from on farm chickpea IPM trial in 2017/18 main cropping season at three woredas.

Treatment	WRR	NPP	BM	HSW	Yield
Arerti + flat + untreated	22.50	50.2	2891	16.2	1510
Arerti + raised bed +treated	10.75	65.5	4089.5	17.5	2113
Habru + flat +untreated	20.75	58.2	3147.0	25.3	1575
Habru + raised bed +treated	12.5	73.2	3692.5	25.5	2250
Mean	16.62	61.81	3455.2	21.13	1862
CV(%)	24.5	11.9	22.8	4.7	15.9
LSD (0.05)	6.5	11.81	1264.2	1.61	474.3

Note: WRR= wilt root rot (%), NPP: number of pods per plant, BM= biomass yield (kg/ha), HSW= hundred seed weight (gm.) and YLD= grain yield (kg/ha)

Recommendation

- **Tolerant varieties with raised bed type and treating seed with fungicide reduce the incidence of wilt/root rot disease in high waterlogging area.**
- **It minimize the primary source of inoculums through cultural practices.**
- **Seed treatment improves germination and plant stand uniformity.**
- **It needs attention on frequency of ploughing will be reduced inoculum source.**
- **Phenotyping of major races in country need focus.**

Short term training

Title of the training	Target participants	Male	Female
Training on improving chickpea productivity through Integrated Pest Management (IPM) and agronomic practices package in May 27-28, 2018.	Farmer's	12	7
	DA's	4	0
	Extension/Expert	2	0
	Total	18	7

Training photo



Cont...



Challenges

- **Waterlogging and terminal drought.**
- **Dry/root rot**
- **Pathogenic variability.**

2018 Plan activities

Activities	Year three
Demonstration of the technology per sites	30-40
Train the farmers on IPM technology	40-50
Train development agents on IPM technology	10-15
Organize the field days or travelling workshop	50-60??

Thank you !!!

Acknowledgment

