**Regional Hand Planter Trials
Research Proposal 2013**


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**Objective and Needs**

OSU has developed a hand planter for third world use that is especially well suited for maize. The current iteration of the OSU hand planter is now to the point where it should be evaluated in the field against common farmer practices. Therefore the objective of this research is to document farmer levels of production using their common planter and methods, and to compare this with the new OSU planter and planting methodology. In order to properly vet this technology, farmer field trials are proposed for 40 sites. Because these trials are targeted for the third world, there are obvious expenses for the national program staff members that will conduct this work with farmers (gas, fertilizer, transport, etc.).

**Methods**

For each hand planter that is delivered, we expect to obtain final grain yield data recorded in kg/ha for at least 2 field trials. The protocol and treatment structure for each trial is included in Figure 1.

Prior to initiating the trial, the OSU planter must be checked to assure that singulation (one seed per strike) has been achieved for the maize variety/hybrid to be used at each site. If consistent blanks or triples are encountered, the reciprocating drum using different cavity sizes will need to be replaced/modified accordingly. Final estimates of singulation (for each planter at each site) need to take place whereby blanks, singles, doubles, and triples are recorded for 10 sets of 10 strikes each. If at least 80% singulation cannot be achieved, using the local maize seed (and after modifications have been attempted), trials at this site should be cancelled until next year. Furthermore, if more than 2% blanks are encountered, trials should also be cancelled until next year or/until planter modifications can resolve this problem. Blanks are simply unacceptable for farmers.

For the OSU planter, it is thus worth repeating that planting doubles, triples, and blanks have to be kept to a minimum.

**Variables to be measured, all plots:**

Grain yield by plot

 Where possible, Greenseeker NDVI, 8 leaf stage

 Site specifics need to be recorded by site (following Figure 1)

**Statistical Analysis:**

For all dependent variables collected, statistical analysis will focus on differences between treatments, specifically the use of the farmer method (2-3 seeds placed in planter-induced depressions in the soil, roughly 30-40cm apart), compared to using the OSU planter/system.

**Time Table**

Date Experimental Activity \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

May 2013 Hand planter release in El Salvador, Guatemala, Asia.

May-June 2013 Field trials established, planted, and fertilized.

July 2013 Greenseeker NDVI data collected and recorded by plot

September 2013 Maize harvest, computation of yield, data recording

October 2013 Data analysis by site, and over sites

November 2013 Combined site analysis, draft report completed

December 2013 Final annual report submitted to AGCO

**Budget**

Item n Cost
Manufacture/final design, OSU hand planter 20 ($500 ea) $10,000

By-site support to National Program 40 ($200 ea) $8,000

 (includes gas money, misc. expenses)

Data analysis and re-design 1 $1200

PIII design, manufacture and testing 1 $2000

OSU Indirect costs, 19% $4028

**Total $25,228**

**OSU portion, 70% $17,659**

**AGCO portion, 30% $7,568**

This budget is an estimate only and not restricted by category. If the project is funded, the award will be a fixed price agreement. AGCO will only pay 19% on indirect costs.

Expenditures may include general purpose office, computer supplies, hourly wages, and other experimental costs associated with travel, management, maintenance, and/or any other project needs.

Figure 1. Protocol for regional trials and associated treatment structure evaluating the OSU hand planter against conventional stick planting of maize taking place, by location.

|  |  |  |
| --- | --- | --- |
| **Regional Trials Protocol and Treatment Structure** |  |  |
| Replications:  | 3 |   |   |   |
| Treatments:  | 10 |   |   |   |
| Sites per hand planter:  | 2 |   |   |   |
| Target plant population/ha | 76,000 |   |   |   |
| Plot length, m | 10 |   |   |   |
| Rows per plot | 4 |   |   |   |
| Row width:  | 70-100cm |   |   |   |
| Fertilizer application | preplant, surface |   |   |
| Added fertilizer | as per soil test recommendations |   |
| Maize seed | determined by location/region |   |
| Singulation estimate (pre plant) | % |   |   |   |
|  |  |  |  |  |
|   |   | **Preplant** | **Distance between** |
| **Treatment** | **Planter** | **N rate, kg/ha** | **seeds, cm** |
| 1 | Farmer | 0 | farmer practice |
| 2 | Farmer | 50 | farmer practice |
| 3 | Farmer | 100 | farmer practice |
| 4 | OSU | 0 | 18 |   |
| 5 | OSU | 50 | 18 |   |
| 6 | OSU | 100 | 18 |   |
| 7 | OSU | 0 | 25 |   |
| 8 | OSU | 50 | 25 |   |
| 9 | OSU | 100 | 25 |   |
|  |  |  |  |  |
| **Post Trial Data Needed** |  |  |  |  |
| WE HAVE TO GET THE PLANTER BACK: (engineering wear and tear) |   |
| Grain yield by plot |   |   |   |   |
| Row width |   |   |   |   |
| Planting date (A) |   |   |   |   |
| Harvest date (B) |   |   |   |   |
| Estimate of rainfall (A to B) |   |   |   |   |
| Average temperature (A through B) |   |   |   |
| [www.weather.com/outdoors/agriculture/growing-degree-days](http://www.weather.com/outdoors/agriculture/growing-degree-days) |   |   |   |
| Maize hybrid used |   |   |   |   |
| Estimate of planting population (farmer practice) |   |   |   |
| Row spacing employed |   |   |   |   |
| Common fertilizer N rate for the area |   |   |   |