THE GREENSEEDER

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In partnership with CIMMYT/Indigdev/AguaSeis

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The GreenSeeder User’s Manual April ‘14

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THE

GREENSEEDER

HAND PLANTER

*An Implement for*

*the Use of Small*

*Scale Farmers*

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ABOUT

PARTS LIST

Steel Pin With Wire Lock

Pin Diameter 3/8”

Usable Length 2 1/2”

Pin Length 3 1/8”

Inside Clearance 1 5/8”

Note: Not to Scale

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USAGE

*USA Edition*

PVC Threaded Adapter

Nominal Diameter 1 1/2”

Singulation Drums X2

Nominal Diameter 1”

Nominal Length 2 1/2”

(Maize and Urea Drums

included)

(Urea Drum delivers

1.5 g/strike)

Transfer Arm

Slot Diameter 1”

Nominal Length 2.5”

Separate Wire Pin

Wire Diameter 0.1”

(May not look exactly like image)

Outer Housing

Material Aluminum

Bottom Hole Diameter 1/4”

Inner Barrel

Material Plastic

Thread NPT 1 1/2”

(Built-In Brush Not Pictured )

Compression Spring

Material Stainless Steel

Diameter 2”

Bushing/Tip

Material Steel

Collar Diameter 2”

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ASSEMBLY

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ASSEMBLY

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***ASSEMBLY***

How to assemble the individual elements that make up an operational GreenSeeder.

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***USAGE***

How the GreenSeeder works and best way to operate the device.

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Locate the *singulation drum* and *transfer arm*. Plug the *seed drum* into the *transfer arm.*

Assembled *drum and arm.*

Locate the *inner barrel* and *outer housing*. Insert the *inner barrel* in to the *outer housing.*

Insert the assembled *drum and arm* through the *outer housing* into the *inner barrel.*

*Feeding the World*

*One Seed at a Time*

Seperate chemically treated seeds from the hands of small farmers

Decreased soil erosion from improved plant spacing

Accommodate mid-season applications of urea-N fertilizer

Place urea below the surface reducing NH3 losses

Potential to provide significant increases in third world corn production.

**An Appeal for the World**

 Corn (also known as maize) in the developing world is planted by hand (as seen in the picture to the right, of a producer planting in El Salvador). This amounts to almost 80,000,000 acres (32,000,000 ha’s), just shy of the total acres of mechanically planted corn in the US. Despite the fact that third world maize yields are generally less than 2.0 Mg/ha (\*Dowswell et al., 1996), this 25% yield increase on 60% of the hand planted maize area in the third world would be worth more than 2.4 billion dollars/year For some time, the developing world has needed a hand planter capable of singulating seed with every strike and that removes the chemically treated seeds from their hands.

 Exemplary farmers ignite both innovation and progress. In order to capitalize on farmer innovation we have to deliver products that allow them to move forward. The GreenSeeder puts that opportunity in their hands. Additionally, the GreenSeeder also serves as a mid-season fertilizer applicator by simply changing the internal drum. Getting urea fertilizer incorporated into the soil has a striking effect on improved use efficiency, by avoiding volatilization losses when urea is surface applied. Finally, homeowners, gardeners, wildlife enthusiasts will all find added value in this planter for virtually all kinds of seeds.

Developed by:

*Oklahoma State University Faculty and Graduate Students*

Senior Scientists: *Randy Taylor, Bill Raun, Nyle Wollenhaupt*

Graduate Students: *Adrian Koller, Joshua Ringer, Eric Lam, Peter Omara, Sulochana Dhital, Ethan Wyatt, Natasha Macnack, Jeremiah Mullock, Bee Chim, Candi Byani, Max Metcalf, Wayne Kiner*

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ASSEMBLY

Ensure the *outer housing* pin is in the *transfer arm* slot.

Secure the *transfer arm* by inserting a *wire pin* in to the *outer housing* pin.

Assembled *barrel and housing.*

Locate the *spring* and *bushing/tip*. Insert the *spring* then *bushing/tip* in to the assembled *outer housing*.

Locate the *steel pin with wire lock*, and insert in the *outer barrel* to secure the *bushing/tip*.

Assembled *GreenSeeder*.

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***CONTACT***

Whom inquiries can be made to, in order to obtain more information regarding the GreenSeeder.

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AGRONOMICS

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Maize production is only one of many capabilities embodied by the GreenSeeder implement. Legume interseeding systems can be more easily established, especially for maize-phaseolus systems common in Central America. Mid-season fertilizer applications with the GreenSeeder allows for more nitrogen in the ground, and more money in producers’ pockets. Internal drums, machined or modified, can plant virtually any “relay” crop to maize. Whether the seed size is small or large, the GreenSeeder planter will accommodate what you seek in terms of crop.

Gardeners are encouraged to use the GreenSeeder for every plant type available to them. Similarly, those in the wildlife and food plot areas should consider using the GreenSeeder to improve emergence of seeds they are hoping to establish in remote areas that cannot be met by mechanized means. Advanced planting techniques such as intercropping and no-till practices are now easier and cheaper with the GreenSeeder.

More experimentation means more modifications of the planting tip and internal drum are anticipated. Having a planter that can adapt to local needs is critical in our design. Drawing input from the global community is crucial to meet the needs of an ever changing planet. Help us help each other by using the Contact page, or direct to bill.raun@okstate.edu.

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USAGE

1. Fill the PVC pipe handle with around 1 kg of selected seed.

*Optional:* Lay planting string clearly marked with correct spacing, for research plots, where specific population counts are needed.

Hold the hand planter vertically (approximately at right angle) to the ground surface.

2. Strike the soil with the planter leaning towards the operator.

While holding the planter in that position, with the planter tip in the ground, move the handle forward (away from the operator) until the planter is almost perpendicular to the ground.

3. Pull the hand planter out of the hole to drop the seed.

Repeat as needed to complete the entire field.

Clear the tip of impacted soil if needed.

Refill the PVC pipe with seeds when almost empty.

**Operating the GreenSeeder**

**Precautions and Safety Measures**

Do not strike the ground with the planter too close to your feet. This may cause an unexpected injury.

Do not use the planter on extremely hard ground, as this will lead to planter failure.

Do not handle treated seeds with bare hands. Use gloves to avoid direct contact with treated seeds.

Wash your hands thoroughly with soap after planting.

*User’s Manual, April 2014*

*—Norman Borlaug, 1970 Nobel Peace Prize Laureate*

You cannot build a peaceful world on empty stomachs and human misery.

**Be a Part of the Global Community**

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***PARTS LIST***

All the off the shelf and custom made parts required for GreenSeeder assembly.

\*Dowswell, C.R., et al. 1996. CIMMYT mega-environment database, Maize in the Third World, Boulder, Colorado, Westview Press.

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STANDARD PROTOCOL

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***S. PROTOCOL***

Layout for trials to provide comparable data between local and GreenSeeder planting practices.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **9** | **6** | **1** | **8** | **7** | **5** | **2** | **4** | **3** | **10** |
| **6** | **5** | **7** | **4** | **3** | **1** | **9** | **8** | **10** | **2** |
| 2 | **10** | **5** | **1** | **4** | **6** | **8** | **3** | **9** | **7** |
| **Plot Layout** | **Plot Number** | **Method Type** | **Preplant N rate, kg/ha** | **Distance Between Seeds, cm** |
|  | **1** | Local | 0 | Local |
|  | **2** | Local | 50 | Local |
|  | **3** | Local | 100 | Local |
|  | **4** | GreenSeeder | 0 | 18 |
|  | **5** | GreenSeeder | 50 | 18 |
|  | **6** | GreenSeeder | 100 | 18 |
|  | **7** | GreenSeeder | 0 | 25 |
|  | **8** | GreenSeeder | 50 | 25 |
|  | **9** | GreenSeeder | 100 | 25 |
|  | **10, User’s Choice** |  |  |  |
| **Notes** |  |  |  |  |

10m

**{**

70 to 100 cm

Note additional information including grain yield by plot, row width, planting date, harvest date, estimated rainfall, average temperature, type of seed used, and anything else.

**Additional Information**

The *Urea Drum*  provides 1.5 g urea per strike per plant (population of 70,000 seeds/hectare) equating to 50 kg N/ha.

Supply and Distribution

**www.idigdev.org**

Design and Manufacturing

**www.nue.okstate.edu/Hand\_Planter.htm**

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**www.smallfarmtoolbox.com/greenseeder**

**www.aguaseis.org/terraseis**

*Feeding the World*

*One Seed at a Time*

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