**ANNEX 14 - MATOOKE SEED SET PROTOCOL**

**Protocol for increasing seed set in Matooke using a sucrose solution**

With difficulty of seed set in banana after controlled pollination, the idea is to make manipulations to overcome these barriers using a cheap technique for technicians. This work in progress. First the technique of a sucrose solution was applied to increase seed set with Calcutta 4 selfs. A 3% solution of sucrose without minerals was made using tap water sprayed on stigmas using a hand spray pump before pollination between 8 and 9 am. Bracts where forced open before opening. The rational was to try and catch Matooke ovules before they wither just after flowering. Results indicated that there was more seed set on Calcutta 4 bunches which were sprayed with sucrose compared to those that were not sprayed before pollination.

|  |  |
| --- | --- |
| Calcutta 4 self-pollinated without sucrose | Calcutta 4 self-pollinated with sucrose |
| C:\Users\Personal\Desktop\Research\Phone doc.s\pnone pix\20151119_120013.jpg | C:\Users\Personal\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\IMG_20160121_124456.jpg |

**Calcutta 4 self-pollinated 3 days without sucrose solution and with sucrose solution**

Using Calcutta 4 as the male parent, the same procedure was repeated on both seed fertile (Enzirabahima) and seed sterile (Nakitembe) Matooke starting with pollination on the day of bract opening. Preliminary results are showing an increase in seed set in the seed fertile Matooke but not the seed sterile. Part of the data collected is in Table 2.1. Percentage increase in seed was calculated as (average seed per bunch for sucrose – average seed per bunch for normal pollination) divided by average seed per bunch for normal pollination multiplied by 100%

= ((5.4 – 2.6)/2.6) X 100%

= 108%

Results show an increased average seed per bunch for bunched pollinated with sucrose (5.4) solution compared to normal pollinations (2.6). This implies that the 3% sucrose solution increased pollen germination. Results also showed that bunches pollinated with sucrose solution had some seed set in the first hands unlike bunches pollinated using customary techniques implying that first hands may not be as receptive as latter hands. Last but not least, bunches pollinated in the rainy or wet season had lower seed set compared to dry season for both techniques thus the strong association of dry seasons to seed set. No seed set has been obtained using both techniques for the seed sterile Matooke and bunches are yet to be harvested for the Mchare varieties.

**Preliminary results for pollination technique manipulations to increase seed set in seed fertile matooke - Enzirabahima**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Polln Sn | Technique | Serial Nbr | Nbr of Fgrs | Polln date | S/H1 | S/H2 | S/H3 | S/H4 | S/H5 | S/H6 | S/H7 | S/H8 | Total seed |
| Dry | Norm | Enz1-1 | 65 | 21-Jan | 0 | 0 | 0 | 0 | 0 |  |  |  | 0 |
| Dry | Norm | Enz1-2 | 120 | 29-Jan | 0 | 0 | 0 | 0 | 0 | 1 | 0 |  | 1 |
| Dry | Norm | Enz1-3 | 82 | 01-Feb | 0 | 1 | 0 | 2 | 1 | 1 |  |  | 5 |
| Dry | Norm | Enz1-4 | 60 | 13-Feb | 0 | 0 | 0 | 1 | 0 |  |  |  | 1 |
| Dry | Norm | Enz1-5 | 84 | 20-Feb | 0 | 0 | 0 | 1 | 0 | 1 |  |  | 2 |
| Dry | Norm | Enz1-6 | 104 | 28-Feb | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 0 |
| Wet | Norm | Enz1-7 | 108 | 13-Mar | 0 | 0 | 2 | 2 | 1 | 7 | 2 |  | 14 |
| Wet | Norm | Enz1-8 | 84 | 21-Mar | 0 | 1 | 0 | 0 | 2 | 1 | 0 |  | 4 |
| Wet | Norm | Enz1-9 | 76 | 25-Mar | 0 | 0 | 0 | 0 | 0 |  |  |  | 0 |
| Wet | Norm | Enz1-10 | 92 | 28-Mar | 0 | 0 | 4 | 0 | 2 | 3 | 1 |  | 10 |
| Wet | Norm | Enz1-11 | 52 | 09-Apr | 0 | 0 | 0 | 0 |  |  |  |  | 0 |
| Wet | Norm | Enz1-12 | 128 | 05-May | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wet | Norm | Enz1-13 | 124 | 08-May | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 0 |
| Wet | Norm | Enz1-14 | 78 | 13-May | 0 | 0 | 0 | 0 | 0 | 0 |  |  | 0 |
| Wet | Norm | Enz1-15 | 51 | 23-May | 0 | 0 | 0 | 1 | 1 |  |  |  | 2 |
| **Total** |  |  |  |  | **0** | **2** | **6** | **7** | **7** | **14** | **3** | **0** | **39** |
| Average seed per bunch | | | **87** |  |  |  |  |  |  |  |  |  | 2.6 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Polln Sn | Technique | Serial Nbr | Nbr of Fgrs | Polln date | S/H1 | S/H2 | S/H3 | S/H4 | S/H5 | S/H6 | S/H7 | S/H8 | Total seed |
| Dry | Suc | Enz2-1 | 104 | 10-Feb | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 0 |
| Dry | Suc | Enz2-2 | 90 | 13-Feb | 0 | 0 | 9 | 11 | 10 | 3 |  |  | 33 |
| Dry | Suc | Enz2-3 | 93 | 14-Feb | 0 | 0 | 0 | 1 | 0 | 0 | 0 |  | 1 |
| Dry | Suc | Enz2-4 | 84 | 26-Feb | 0 | 0 | 0 | 1 | 2 | 1 | 0 |  | 4 |
| Dry | Suc | Enz2-5 | 78 | 09-Mar | 1 | 0 | 10 | 6 | 4 | 0 |  |  | 21 |
| Wet | Suc | Enz2-6 | 68 | 06-Apr | 0 | 0 | 1 | 2 | 0 |  |  |  | 3 |
| Wet | Suc | Enz2-7 | 90 | 12-Apr | 0 | 0 | 0 | 0 | 0 | 0 | 1 |  | 1 |
| Wet | Suc | Enz2-8 | 72 | 12-Apr | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 0 |
| Wet | Suc | Enz2-9 | 100 | 20-Apr | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 0 |
| Wet | Suc | Enz2-10 | 96 | 24-Apr | 0 | 0 | 0 | 1 | 0 | 1 | 0 |  | 2 |
| Wet | Suc | Enz2-11 | 90 | 30-Apr | 0 | 0 | 0 | 0 | 0 | 0 |  |  | 0 |
| Wet | Suc | Enz2-12 | 70 | 06-May | 0 | 0 | 0 | 0 | 0 |  |  |  | 0 |
| **Total** |  |  |  |  | **1** | **0** | **20** | **22** | **16** | **5** | **1** |  | **65** |
| **Average** |  |  | **86** |  |  |  |  |  |  |  |  |  | **5.4** |
| % increase | | | | | | | | | | | | | 108 |

**Note:**

1. Norm = normal pollination technique, Suc = sucrose solution pollination technique, Polln Sn = season of pollination, Nbr of Fgrs = Number of fingers, Polln date = Date of pollination, S/H = seeds per hand
2. Some columns were removed from the table including bunch weight, fingers per hand, harvesting data and date of seed extraction