

Programme

1. Opening prayer
2. Introductions
3. Breakfast
4. Tour of the trials
5. Welcoming remarks by Head DAP
6. Remarks by UFEA
7. Remarks by Grainpulse Ltd
8. Presentation of trial results
 - Real IPM
 - Summer flowers
9. Remarks by Danziger representative
10. Way forward
11. Lunch
12. Departure at leisure

Summer flowers trials



Department of Agricultural Production, Makerere University

Challenge

1. What else can be grown in Uganda?
2. What yield?
3. What quality?
4. What are the challenges?
5. What are the profit margins?

1. *Aster spp.*
2. *Callistephus chinensis*
3. *Carthamus tinctorius*
4. *Celosia spicata*
5. *Craspedia globose*
6. *Dianthus spp.*

7. *Gomphrena haageana*
8. *Gypsophilla spp.*
9. *Lepidium virginicum*
10. *Limonium spp.*
11. *Solidago spp.*
12. *Veronica spp.*









Parameters

1. Days to flowering
2. Flower number per stem
3. Inflorescence diameter
4. Inflorescence length
5. Shoot weight
6. Shoot number per plant
7. Spray branches
8. Stem diameter
9. Stem length
10. Vase life

11. Pest and disease incidence

- ~~12. Colour~~
- ~~13. Photosynthetic efficiency~~

1. *Callistephus chinensis* (Chinese aster)



1. *Callistephus chinensis* (Chinese aster)

Parameter	Greenhouse	Open field	P value
Flower number/plant	9.7 a	13.7 b	0.001
Inflorescence diameter (mm)	35.7 a	42.2 b	<0.001
Shoot diameter (mm)	6.3 a	6.9 a	0.194
Stem length (cm)	55.9 b	37.4 a	<0.001

2. Carnations



2. Carnations

Parameter	Greenhouse	Open field	P value
Days to flowering	70.0 a	72.0 b	<0.001
Flower number/plant	46.8 a	76.8 b	0.037
Inflorescence diameter (mm)	28.5 a	30.1 a	0.33
Shoot weight (g)	35.1 a	39.5 a	0.28
Spray branches	10.8 a	15.0 b	<0.001
Stem diameter (mm)	4.8 a	5.5 b	0.02
Stem length (cm)	63.7 b	38.5 a	<0.001
Vase life (days)	7.0 b	4.0 a	<0.001

3. *Carthamus*



3. Carthamus

Parameter	Greenhouse	Open field	P value
Flower number/stem	2.5 a	2.6 a	0.88
Shoot number/plant	4.5 a	6.1 b	0.006
Stem diameter (mm)	4.6 a	4.4 a	0.51
Stem length (cm)	54.3 b	43.0 a	0.003
Head length (mm)	4.3 b	4.0 a	0.04
Head width (mm)	26.4 b	24.2 a	0.03

4. Craspedia



4. Craspedia

Flush 1

Parameter	Greenhouse	Open field	P value
Days to flowering	89.9 a	89.2 a	0.57
Inflorescence diameter (mm)	31.3 a	31.9 a	0.76
Shoot weight (g)	75.4 a	81.4 a	0.76
Shoot number (Week 8)	13.3 a	12.4 a	0.76
Stem diameter (mm)	6.7 a	8.4 b	0.01
Stem length (cm)	111.7 b	97.8 a	0.001

Flush 2

Parameter	Greenhouse	Open field	P value
Shoot number	10.6 a	9.3 a	0.195
Stem diameter (mm)	4.8 a	4.3 a	0.045
Stem length (cm)	98.1 b	55.3 a	<0.001
Head length (mm)	3.6 a	3.2 a	0.148
Head width (mm)	17.9 a	20.9 b	<0.001

5. Gomphrena



5. *Gomphrena*

Flush 1

Parameter	Greenhouse	Open field	P value
Shoot number/Plant	10.6 a	9.3 a	0.195
Stem diameter (mm)	4.8 a	4.3 a	0.045
Stem length (cm)	98.1 b	55.3 a	<0.001
Head length (mm)	3.6 a	3.2 a	0.148
Head width (mm)	17.9 a	20.9 b	<0.001

6. *Lepidium*



6. *Lepidium*



6. Lepidium

Parameter	Greenhouse	Open field	P value
Days to flowering	29.6 a	29.9 a	0.593
Flower number/stem	3.1 a	3.0 a	0.543
Inflorescence diameter (mm)	17.9 b	14.5 a	<0.001
Shoot weight (g)	127.7 a	151.4 b	0.049
Shoot number	3.1 a	3.0 a	0.298
Spray branches	54.7 a	98.0 b	<0.001
Stem diameter (mm)	4.2 a	5.3 b	0.003
Stem length (cm)	84.9 b	62.2 a	0.002
Vase life (Days)	13.0 b	9.6 a	<0.001

7. Solidago



7. Solidago

Flush 1

Parameter	Greenhouse	Open field	P value
Shoot weight (g)	42.0 a	51.3 a	0.345
Shoot number (Week 8)/plant	8.6 a	9.2 a	0.481
Stem diameter (mm)	4.0 a	5.6 b	0.002
Stem length (cm)	76.3 b	59.5 a	<0.001
Vase life (Days)	11.7 b	7.9 a	<0.001

Flush 2

Parameter	Greenhouse	Open field	P value
Shoot weight (5)	152.8 a	142.3 a	0.752
Shoot number/plant	5.0 a	5.0 a	0.327
Stem diameter (mm)	4.2 a	4.7 a	0.061
Stem length (cm)	66.8 b	46.6 a	<0.001

8. Asters



8. Asters



8. Asters



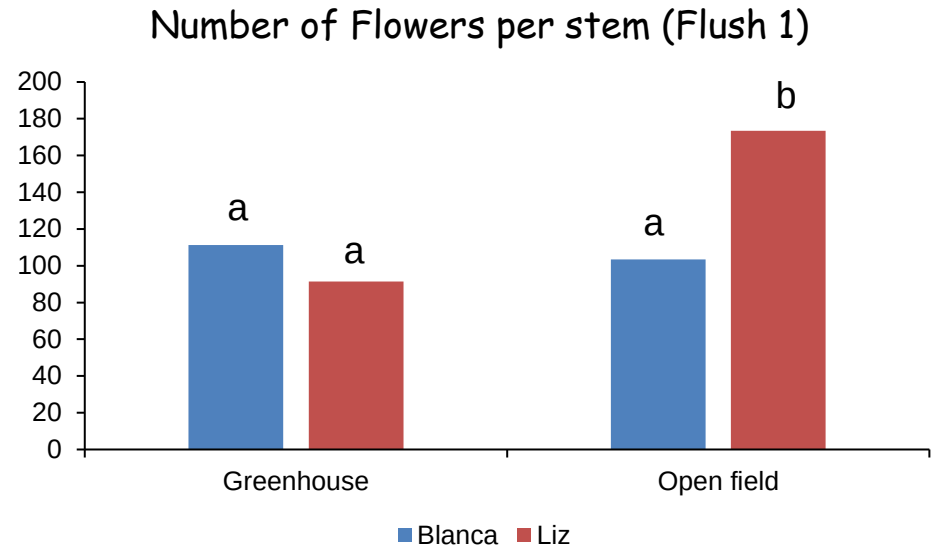
8. Asters

	Days to flowering	Stems/plant (Week 8)	Stem length (cm)	Stem length (cm)
Flush	1	1	2	3
Blanca	64.5 b	10.3 b	57.6 a	59.0 a
Liz	61.9 a	5.9 a	76.2 b	54.7 a
P value	<0.001	<0.001	<0.001	0.12

Open field	65.5 b	9.7 b	57.4 a	50.9 a
Greenhouse	61.0 a	6.8 a	74.4 b	61.4 b
P value	<0.001	0.006	<0.001	<0.001

*Stem number per plant during flushes 2 and 3 = 5

8. Asters

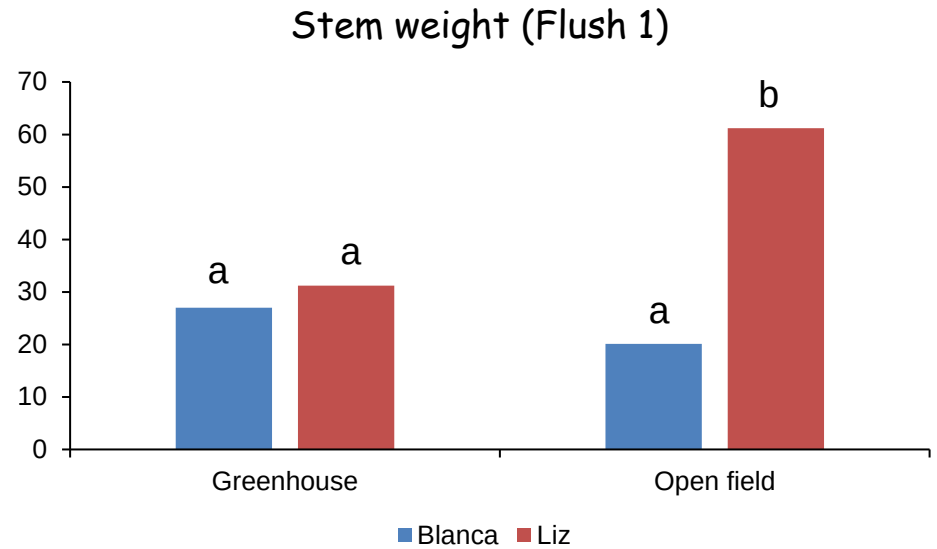


Number of flowers per stem during flushes 2 and 3

Flush	2	3
Blanca	96.2 a	18.5 a
Liz	99.9 a	20.4 a
P value	0.75	0.06

Open field	110.6 b	19.5 a
Greenhouse	85.3 a	19.5 a
P value	0.04	0.99

8. Asters

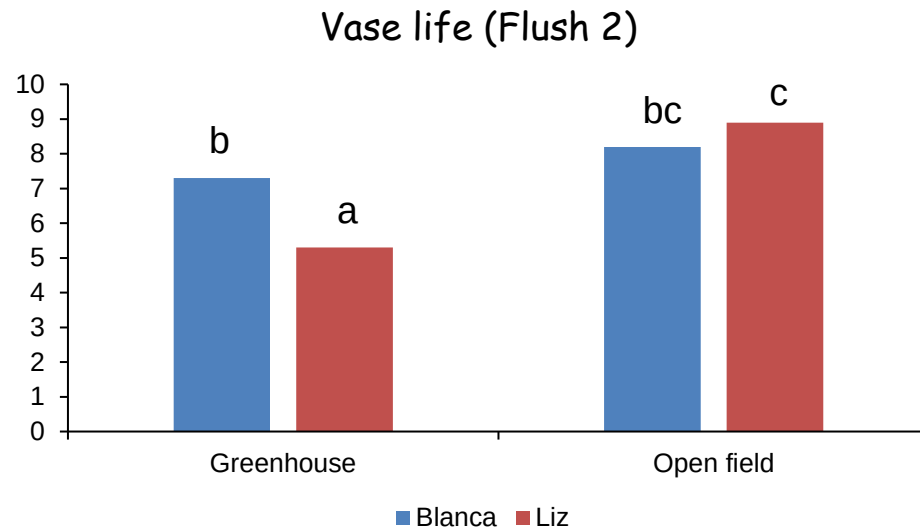


Stem weight during flushes 2 and 3 (g)

Flush	2	3
Blanca	44.4 a	208.5 a
Liz	39.9 a	278.8 a
P value	0.39	0.26

Open field	47.3 a	261.5 a
Greenhouse	37.3 a	234.6 a
P value	0.07	0.73

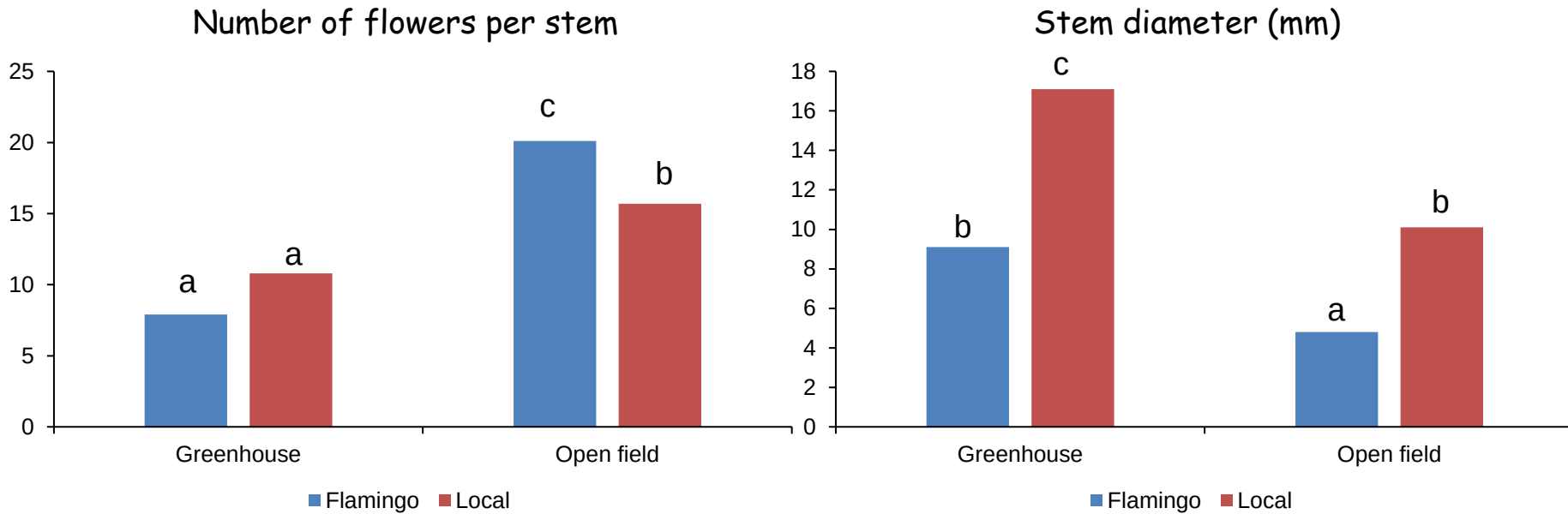
8. Asters



9. Celosia



9. Celosia



9. Celosia

	Stem length (cm)	Head length (mm)	Head width (mm)
Flamingo	90.9 a	16.1 b	18.9 a
Local	144.8 b	10.5 a	18.7 a
P value	<0.001	<0.001	<0.001

Open field	90.6 a	10.5 a	19.6 b
Greenhouse	145.1 b	17.2 b	17.8 a
P value	<0.001	<0.001	<0.001

10. *Gypsophila*



10. *Gypsophila*

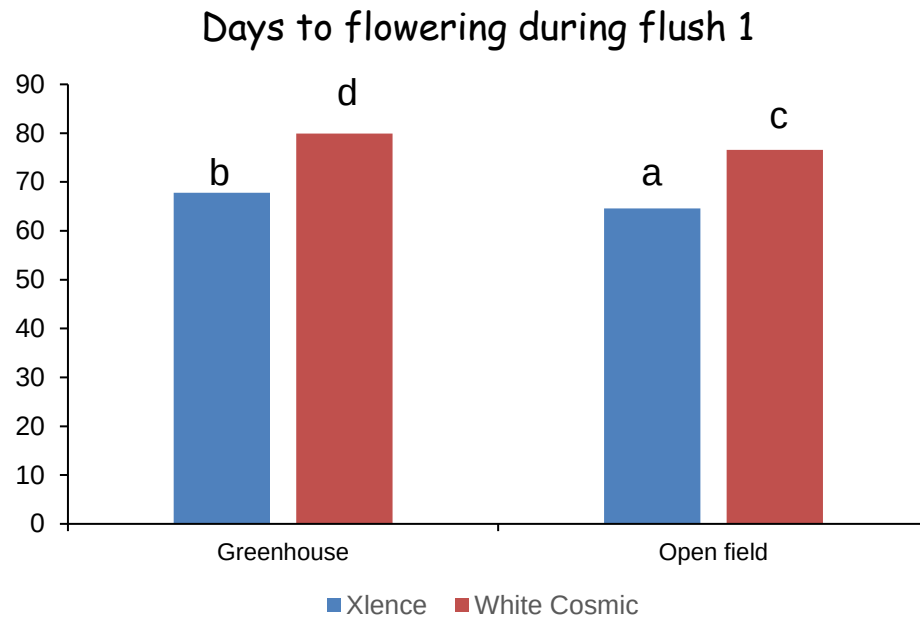


10. *Gypsophila*





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10. Gypsophila

	Flowers/stem	Flowers/stem	Stem weight (g)	Stem weight (g)
Flush	1	2	1	2
Xlence	656.1 b	922.2 b	32.4 a	116.9 a
White Cosmic	524.4 a	699.8 a	33.4 a	98.5 a
P value	0.002	0.006	0.67	0.192

Open field	573.7 a	671.4 a	30.3 a	35.5 a
Greenhouse	606.8 a	1114.6 b	35.5 b	30.3 a
P value	0.391	<0.001	0.02	0.069

10. *Gypsophila*

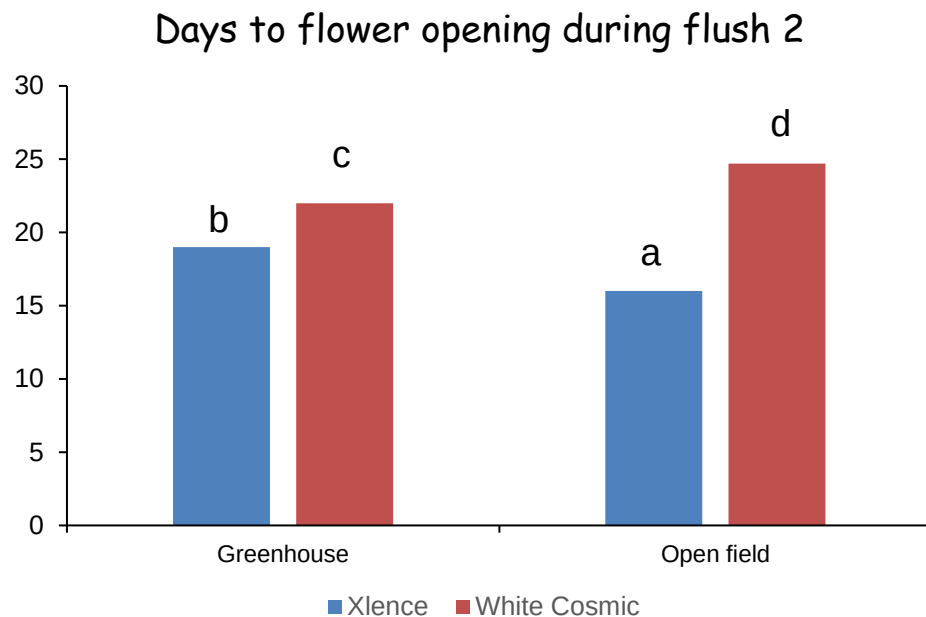
	Stems/Plant	Stem length (cm)	Stem length (cm)	Vase life
Flush	1	1	2	1
Xlence	8.4 a	74.4 a	74.4 a	4 a
White Cosmic	9.2 a	76.7 a	76.7 b	4 a
P value	0.311	0.348	<0.001	1

Open field	8.7 a	68.9 a	82.2 b	3.3 a
Greenhouse	8.9 a	82.2 b	68.9 a	4.7 b
P value	0.77	<0.001	<0.001	<0.001

10. *Gypsophila*

	Days to budding
Flush	2
Xlence	17.0 a
White Cosmic	37.7 b
P value	<0.001

Open field	31.7 b
Greenhouse	23.0 a
P value	<0.001

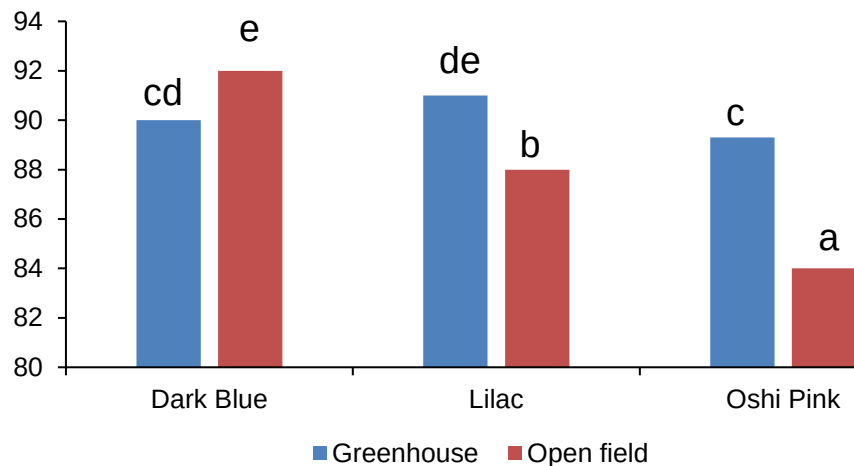


11. Limmonium

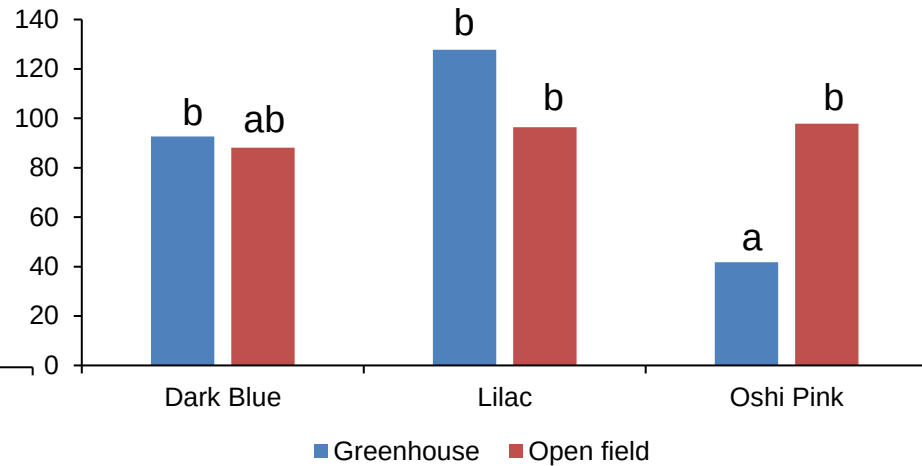


11. Limmonium

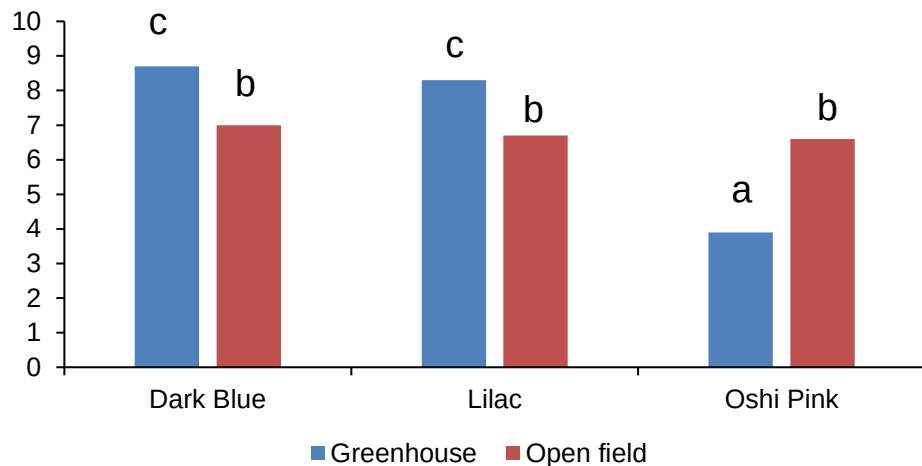
Days to flowering during Flush 1



Stem weight during flush 1 (g)



Vase life during Flush 1



11. Limmonium

	Stems/plant	Stems/plant	Spray branches	Stem length (cm)	Vase life
Flush	1	2	1	1	2
Dark Blue	2.6 b	3.4 b	13.3 a	87.8 b	89.5 b
Lilac	1.7 a	2.4 a	15.0 b	94.2 b	92.2 b
Oshi Pink	2.4 ab	2.7 ab	12.4 a	70.9 a	80.7 a
P value	0.044	0.028	<0.001	<0.001	<0.001

Open field	2.4 a	3.1 b	13.3 a	73.3 a	73.7 a
Greenhouse	2.0 a	2.4 a	13.9 a	95.3 b	97.3 b
P value	0.178	0.026	0.292	<0.001	<0.001

12. Veronica



12. Veronica



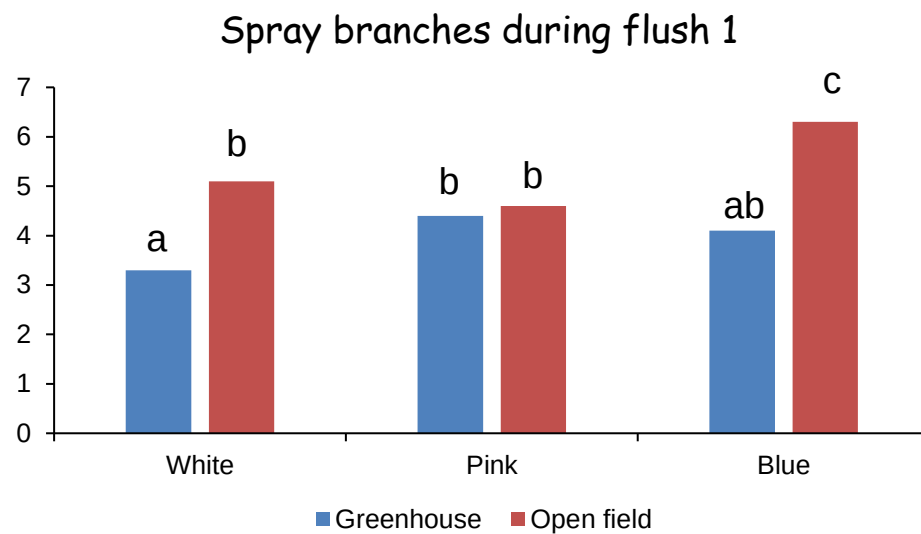




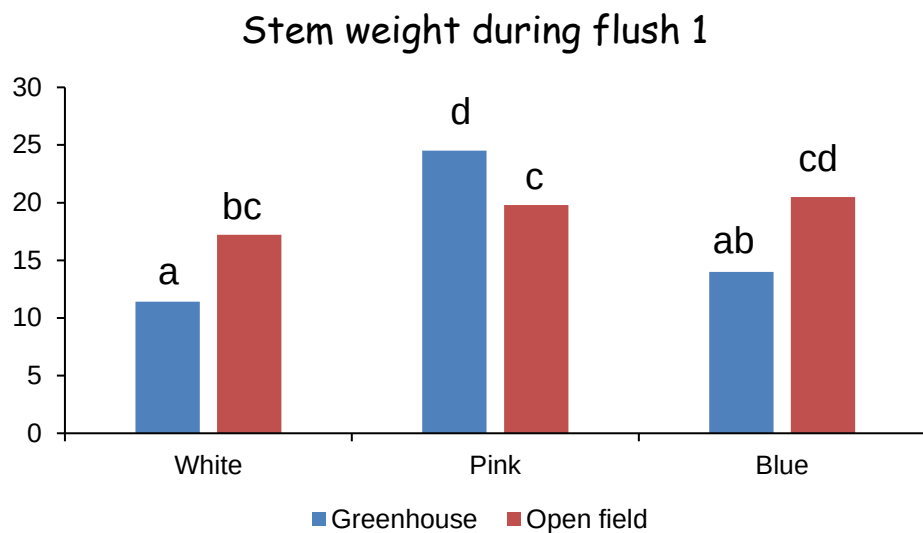
12. Veronica

	Days to flowering
Flush	1
White	58.3 c
Pink	52.8 b
Blue	49.1 a
P value	<0.001

Open field	51.1 a
Greenhouse	55.8 b
P value	<0.001



12. Veronica

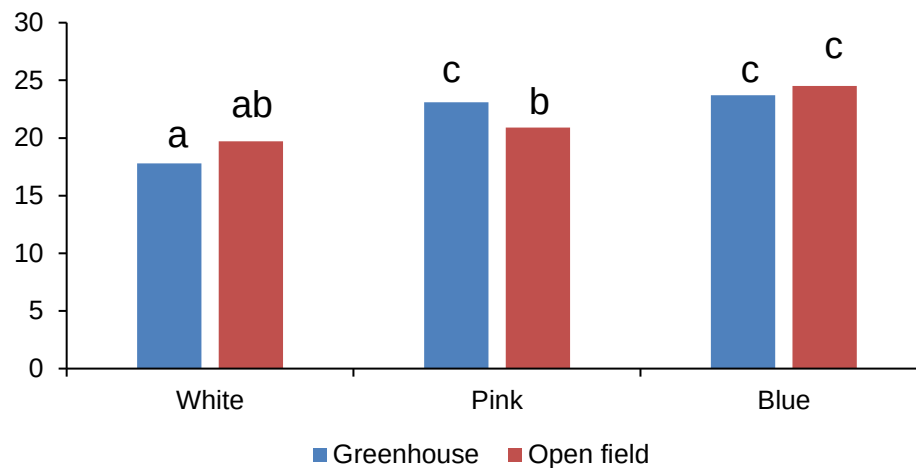


	Stem weight (g)
Flush	2
White	18.7 a
Pink	29.2 b
Blue	18.0 a
P value	<0.001

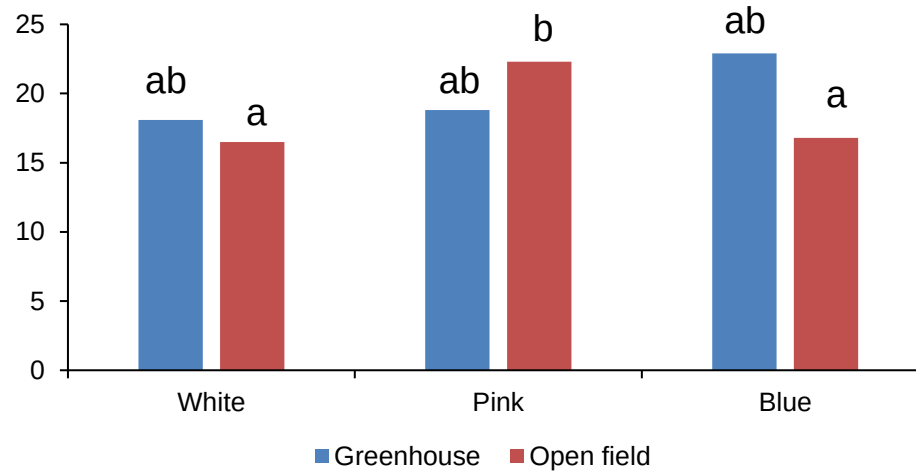
Open field	23.9 b
Greenhouse	20.8 a
P value	0.001

12. Veronica

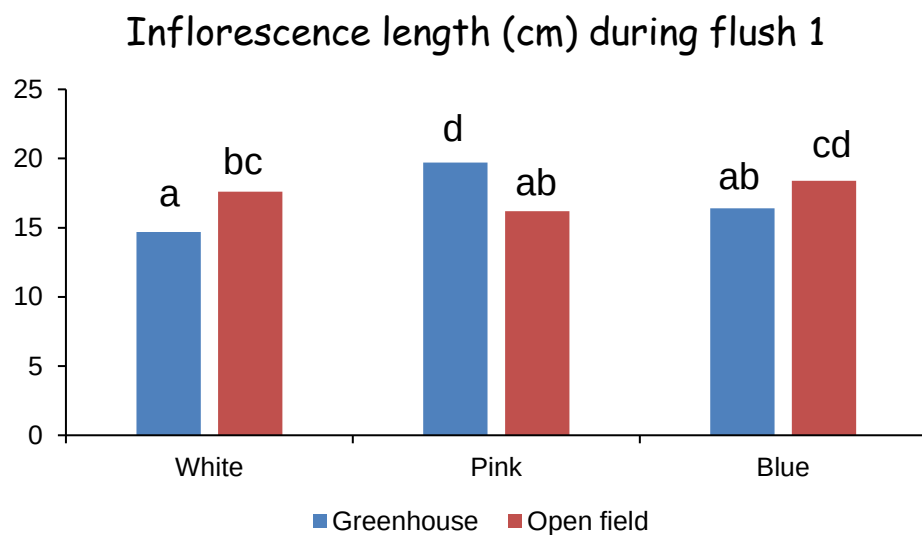
Inflorescence diameter during flush 1



Inflorescence diameter during flush 2



12. Veronica

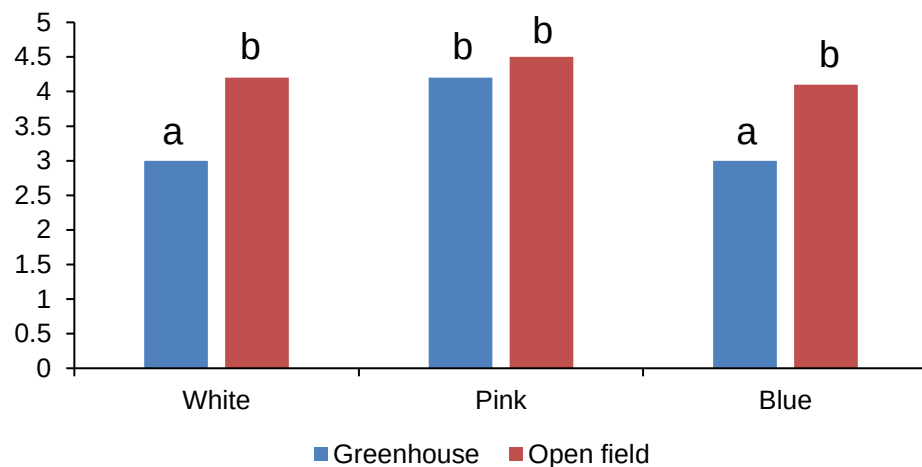


	Inflorescence length (cm)
Flush	2
White	12.5 a
Pink	13.4 a
Blue	12.8 a
P value	0.245

Open field	12.7 a
Greenhouse	13.3 a
P value	0.26

12. Veronica

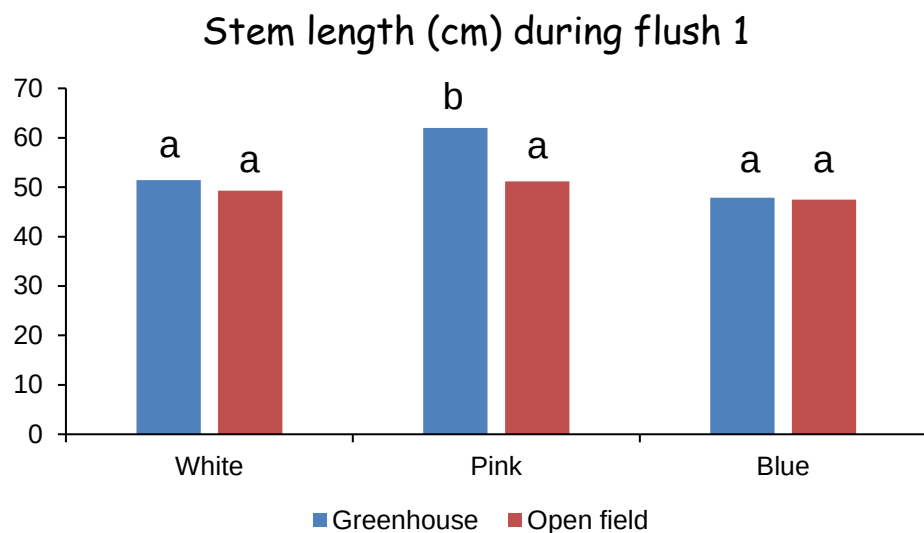
Stem diameter (mm) during flush 1



	Stem diameter (mm)
Flush	3
White	3.3 a
Pink	3.8 b
Blue	3.3 a
P value	<0.001

Open field	3.8 b
Greenhouse	3.1 a
P value	<0.001

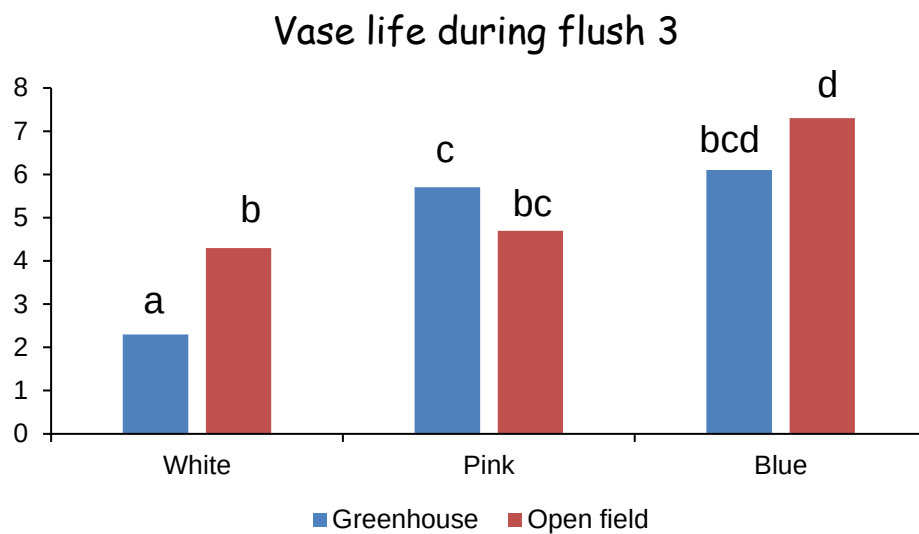
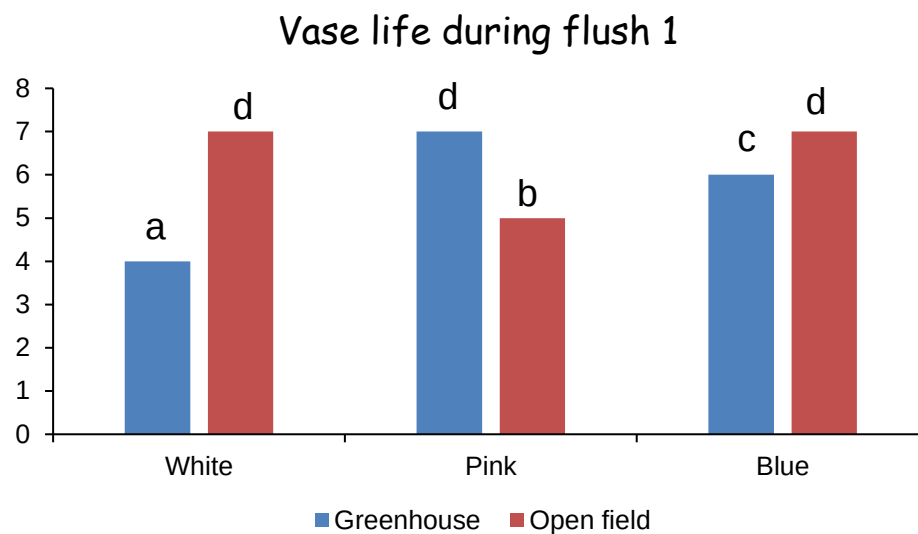
12. Veronica



	Stem length (cm)
Flush	3
White	72.2 a
Pink	95.6 b
Blue	70.8 a
P value	<0.001

Open field	75.7 a
Greenhouse	86.4 b
P value	0.008

12. Veronica



Fertilizer use

Tank A	Quantity/month (kg)
Calcium nitrate	25.536
Potassium Nitrate	6.627
Chelated Iron	0.336

Tank B	
Magnesium Sulphate	13.08
Mono Potassium Phosphate	2.112
Mono Ammonium Phosphate	1.584
Potassium Nitrate	12.552

So far

1. *Aster* spp.
2. *Callistephus chinensis*
3. *Carthamus tinctorius*
4. *Celosia spicata*
- ~~5. *Craspedia globosa*~~
6. *Dianthus* spp.

7. *Gomphrena haageana*
8. *Gypsophilla* spp.
9. *Lepidium virginicum*
10. *Limonium* spp.
11. *Solidago* spp.
12. *Veronica* spp.

Way forward

1. Short course on summer flowers production
2. Repeat the trials at Makerere University and selected flower farms
 - Import of young plants
 - Infrastructure (Plastic and insect netting)
 - Fertilizers
 - Biological pest and disease control agents
 - Human resource (Postgraduate students)
 - Trials coordination
3. Promote summer flowers production also among smallholder growers



**Makerere University
Research and Innovations Rund**

1. Rwotonen Innocent Bob
2. Swadik Yassin
3. Bridget Nayiga
4. Nkajja Bonny
5. Susan
6. Winnie Naiga
7. Emiu Dennis
8. Siraje Ssengendo
9. Kibaire Abel
10. Naiga Gorett

