Agricultural Development and Advisory Service

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CONTRACT REPORT

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Effects of a range of covering materials on Germination

Undertaken for HDC

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PRINCIPAL WORKERS

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AUTHENTICATION

I declare that this work was done under my supervision according to the procedures described herein and that this report represents a true and accurate record of the results obtained.

..... J G Farthing
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CONTENTS

EFFECTS OF A RANGE OF COVERING MATERIALS ON GERMINATION

Summary

Seeds of Marigold, Petunia, Salvia and Verbena were sown into trays of standard seed compost. Coverings of peat/sand, peat, sand and medium or coarse vermiculite were applied to a depth of 1 - 2 mm or 5 mm. Uncovered controls were also sown.

Considerable variability was observed between replicates in the trial. The only significant effects were a suppression of Salvia when a 5 mm layer of sand was used and all coverings were better than the controls in the case of Verbena.

Introduction

Various materials can be used for covering seeds but most growers probably use seed compost. The question is whether other materials would improve the germination percentage and the uniformity of germination.

The object of the trial was to determine the effects of a range of covering materials on the germination of bedding plant seeds.

Materials and Methods

Site: a germination room at the Lee Valley EHS

Treatments

1	Covering materials:	no covering ADAS 100% peat (seed) compost ADAS peat/sand (seed) compost medium vermiculite, 2 mm particle size coarse vermiculite, 4 mm particle size coarse sand, 1 mm - 5 mm particle size
2	Depth of covering:	1 - 2 mm 5 mm
3	Species:	Marigold cv Naughty Marietta Petunia cv Galaxy Mixed Salvia cv Blaze of Fire Verbena cv Sparkle Hybrid

In order to contain seed costs, standard quality seed was used rather than expensive hybrids which could cost up to twenty times more.

The ingredients of the two seed composts used as covering materials were as follows:

100% medium Irish peat

or 75% medium Irish peat, 25% coarse sand
plus 4 kg ground chalk per m^3 peat
plus 1 kg single superphosphate and
0.5 kg potassium nitrate per m^3 of mixed compost

All were mixed thoroughly prior to use.

Design

One plot consisted of 50 seeds in a half standard seed tray. There were three replicates of each treatment in a fully randomised design.

Assessments: the number of seedlings with expanded cotyledons from 50 seeds sown was counted.

Statistical Analysis: the records were subjected to Analysis of Variance.

Cultural conditions

Sowing: half seed trays were filled to a depth of 25 mm with the 75% peat 25% sand seed compost (see under "treatments"). Fifty seeds were sown per tray and the experimental coverings applied. The trays were covered with a clear film plastic and placed in a germination room with a low level of illumination.

Diary:

Species	Date sown	Date recorded	Temperature setpoint, °C
Marigold	3 February	10 February	21
Petunia	2 March	14 March	21
Salvia	2 March	15 March	21
Verbena	8 July	23 July	18

Results

The number of seedlings of Marigold, Petunia, Salvia and Verbena are shown in Tables 1 - 4 respectively.

Table 1: Marigold - number of seedlings from 50 seeds 7 days from sowing

depth of cover	uncovered control	peat	peat/ sand	vermiculite medium	vermiculite coarse	sharp sand
1-2 mm	40.3	45.0	44.0	44.7	44.0	40.3
5 mm	39.7	42.7	43.0	43.7	43.7	39.7
mean	40.0	43.8	43.5	43.0	43.8	40.0

SED between two compost means 1.7 (22 df) between two individual means 2.4

The Marigold seed germinated well and there were no significant differences between any of the treatments

Table 2: Petunia - number of seedlings from 50 seeds 12 days from sowing

depth of cover	uncovered control	peat	peat/ sand	vermiculite medium	vermiculite coarse	sharp sand
1-2 mm	19.3	29.3	24.0	23.0	26.0	17,7
5 mm	22.3	13.0	24.3	32.0	24.7	25.3
mean	20.8	21.2	24.2	27.5	25.3	21.5

SED between two compost means 4.2 (22 df) between two individual means 5.9

The germination percentage of Petunia was less than expected, perhaps due to the use of ungraded, non hybrid seed. There were no significant differences between any of the treatments.

Table 3: Salvia - number of seedlings from 50 seeds 13 days from sowing

depth of cover	uncovered control	peat	peat/ sand	vermiculite medium	vermiculite coarse	sharp sand
1-2 mm	32.3	36.0	32.7	33.3	36.0	27.3
5 mm	36.3	32.0	33.7	35.7	36.7	0
mean	34.3	34.0	33.2	34.5	36.3	13.8

SED between two compost means 2.8 (22 df) between two individual means 3.9

The germination percentage of Salvia was satisfactory. The sand coverings significantly and dramatically reduced germination. There was no significant difference between any of the other treatments. It is generally considered that Salvia require light for germination and it may be that the sand, particularly the 5 mm cover, excluded light.

Table 4: Verbena - number of seedlings from 50 seeds 15 days from sowing

depth of cover	uncovered control	peat	peat/ sand	vermiculite medium	vermiculite coarse	sharp sand
1-2 mm	2.0	13.0	10.7	12.7	13.0	8.3
5 mm	4.3	8.7	15.0	15.7	15.3	11.7
mean	3.2	10.8	12.8	14.2	14.2	10.0

SED between two compost means 1.9 (22 df) between two individual means 2.7

The germination percentage of Verbena was poor, even for a notoriously difficult species. All of the coverings were significantly better than the uncovered controls. There was no significant difference between any of the other treatments.

Discussion/conclusions

The results from this trial suggest that the differences between covering treatments may not be very large and a more precise experiment with more seeds per plot (perhaps 100 instead of 50) would be needed to detect significant differences.