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MODULE PRODUCTION OF BEDDING PLANTS AND IMPROVED SEED PERFORMANCE

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Status of work: continuing for three years

Year of Project: 1

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Period covered: March 1987 - March 1988

The work in the first year of the project has proceeded according to plan. The exception being that treated seed was unavailable in quantity from IHR Wellesbourne in 1987 for commercial trialling at Lee Valley EHS. The basic research work at IHR Wellesbourne has been very detailed and has provided a firm base for this project which should now progress rapidly.

Objective

To make the module system viable and more widely adopted in the industry by improving seed performance of the species range examined. This will achieve a reduction in labour costs of pricking out and in costs of seed.

Module production of bedding plants: improved seed performance

Introduction

Direct seeding of bedding plant species in modules, instead of the traditional technique involving pricking out, offers a number of important advantages, including significantly reduced labour cost, a shorter growing period and improved quality. Some development is already in progress at Lee Valley EHS but much now depends on improved seed quality.

The germination of seeds of many plant species is unreliable, seedling emergence is erratic and slow, resulting in poor stands of variably sized plants. The benefits of direct sowing into modules are unlikely to be achieved unless the quality of seed can be improved to a level which enables a single seed to be sown into each module mechanically and giving a high proportion of these modules with a single plant. In addition, the full potential of good seed is not always achieved because the appropriate environmental conditions for germination (principally light and temperature) are not known or not fully determined.

Summary

Institute of Horticultural Research, Wellesbourne

A full report of this work is available.

Effects of temperature, light/dark, and moisture content

In all five species the effects of the light/dark on percentage germination were small except at temperatures of 30°C in Verbena and Petunia, but all showed a wide optimum temperature range for percentage germination from 10 - 25°C. Seed lots did not interact with temperature or variety. The mean germination time increased with an increase in the osmotic potential of the solution in which seeds were imbibed, with the most marked effects being on Salvia. A method of determining moisture content of compost and relating this to emergence has been established. In general, ~~mean seedling emergence declined with an increase in temperature and the less negative the water potential.~~ percentage seedling emergence and the emergence time was reduced in water imbibed at higher temperatures.

Conclusion

For all species a single temperature of 20 - 25°C gave both the highest and most rapid germination.

Future action

Work on compost moisture content and temperature will be continued to devise optimum regimes for germination.

Marigold sp should be replaced with Primula and Impatiens

Physical methods for improving seed quality

Some success has been achieved with sucrose solutions as a means of "grading" seeds of Verbena and Salvia.

Mechanical grading with air blowers on Salvia and Verbena indicated higher emergencies in Verbena from heavier seed than light, but there was no effect on mean emergence time. There were no significant effects in the performance of Salvia. There was no seed lot x grading interaction.

Conclusions

Seed grading had an effect on Verbena but not on Salvia.

Future action

Separation techniques are to be further evaluated in 1988 to supply seed for trial at Lee Valley EHS.

Chemical treatment of seeds

Experiments with giberellins on Salvia, Petunia, Verbena and Marigold sp demonstrated no positive influence on germination with these treatments. Early results of work on Salvia, Petunia, Verbena and Marigold of priming seed with PEG indicates significant improvement in germiantion can be achieved.

Future action

Confirmatory work on Primula and Impatiens is required to establish rates and treatment times and the work is proceeding in scaling this up and drying back the treated seed ready for commercial trialling at Lee Valley EHS.

Lee Valley Experimental Horticulture Station

Nutrition and transplanting dates for module raised subjects (final report)

Small (15 mm) modules filled with a low nutrient, peat based compost were direct seeded with Marigold, Petunia, Salvia and Verbena.

Liquid feeds containing nitrogen at 100, 200 and 300 mg/litre N and potassium at 100 or 300 mg/litre K_2O (in factorial combination) were applied at every watering once germination was complete. Transplantings were made from the module at weekly intervals once the trays were half covered with foliage and the transplants grown on to marketing stage. Records were taken of the plants both at transplanting and marketing stage.

The rate of nitrogen used greatly influenced plant size at transplanting stage, whereas potassium had no effect. Neither nutrient influenced either production time or plant quality at marketing stage. Manipulation of the nutritional regime did not overcome the detrimental effects or reduced plant size and delayed maturity effects of growing in modules for too long.

Conclusions

The trial is complete and infers that nutrient manipulation will not overcome the delayed maturity effects and reduced plant size of growing in modules for an extended period.

Future action

The trial is complete and no further work needs undertaking. The information should be publicised to the industry and used in future blueprints for module production.

Growth regulation of module raised plants 1987 (interim report)

Impatiens, Marigold, Petunia, Salvia and Verbena were single seeded into 15 mm modules filled with peat based compost. Daminozide was applied as a foliar spray at 0, 500, 1000 and 2000 mg/litre, once, twice, or three times at weekly intervals starting when the first pair of true leaves had developed.

Conclusions

The effects of treatments were surprisingly small, despite the fact that the highest rate was double the manufacturer's recommended rate. Daminozide treated plants were more manageable at transplanting stage but at sale stage they were as large and as well developed as the untreated plants.

Future action

The trial should be repeated with higher rates of daminozide on the less sensitive species with a modified schedule of applications which would permit transplanting at the optimum stage. All treatments should be applied to individual module trays to allow complete randomization. The interaction of nitrogen and growth regulants should be a future project when both studies have been individually completed.

Effects of a range of covering materials on germination (interim report)

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 and 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.

Conclusions

The results suggest differences between covering treatments may not be very large and a more precise experiment with more than 50 seeds per plot would be necessary to detect significant differences.

Future action

The trial is to be repeated with increased seed numbers and the same replication.

J G Farthing
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