Although the nature of this phenomenon is not yet fully understood, there are clear indications that sorption is appreciably reduced and a sufficient amount of insecticide remains effective on the surface for prolonged periods. The work is still continuing, and will be reported in full elsewhere. I should like to thank my colleagues in this Laboratory for their help and criticism and also the management of "Shell" Research, Ltd., for permission to publish this work.

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Sensitivity of Light-inhibited Seeds to Certain Spectral Regions

IN recent years important progress has been made in our knowledge of the light-dependent processes in plant development. Detailed studies of the action spectrum for the photoperiodic control of flowering and for the germination of certain light-requiring seeds, carried out by Borthwick and his co-workers[1], have shown that in both these developmental processes red light is most effective and that under certain conditions infra-red radiation reverses the effect of red illumination. The connexion between photoperiodism and seed germination was further demonstrated by the discovery by Isikawa[2] and by Black and Wareing[3] of the direct photoperiodic control of germination in seeds of a number of species.

As a corollary to our investigations of photoperiodism in the light-requiring seed of *Betula pubescens*[3], a study has been made of the effect of the photoperiodic régime on germination of *Nemophila insignis*, a light-inhibited seed. It has been found that at 21–22° C. these seeds exhibit photoperiodic behaviour with respect to germination, long days inhibiting, and short days permitting, germination. These effects are profoundly modified by temperature. Further details of this work will be published elsewhere.

During this investigation, an examination has been made of the effects of different regions of the spectrum on germination of *Nemophila*. Facilities for a detailed study of the action spectrum were not available and only white, red, blue and infra-red radiation were used. As a source of white light, 'daylight' fluorescent tubes were used. Red light, within the band 5,800–7,000 A., was obtained from red fluorescent tubes in conjunction with red 'Perspex' (*R*.400) as a filter. To obtain blue light, blue fluorescent tubes were used in conjunction with blue 'Perspex' (*B*.705) and copper chloride filters, transmitting the wave-lengths 4,000–5,200 A. Light from a 150-watt tungsten filament lamp passing through the Ilford infra-red filter 207 and a 9·5-cm. thick water screen gave infra-red radiation of the wave-lengths 7,300–10,000 A.

White fluorescent light at an intensity of 1,200 ergs/cm.²/sec. (lower intensities have not been tested) was found to inhibit seed germination at 21–22° C.

Table 1. THE INHIBITORY EFFECT OF BLUE AND RED LIGHT ON THE GERMINATION OF *Nemophila* SEED. TEMPERATURE 21–22° C.

Intensity (ergs/cm.²/sec.)	Percentage germination Red	Blue
3,000	27·5 (89·4)	25·6 (91·6)
2,300	32·4 (87·3)	29·5 (94·2)
1,900	33·3 (88·2)	27·0 (92·3)
1,300	34·5 (91·0)	25·4 (93·7)
1,000	60·0 (96·9)	22·7 (95·0)
800	59·0 (94·4)	19·3 (93·0)
500	55·3 (90·0)	40·5 (92·6)

The figures in parentheses indicate the percentage germination of the dark controls.

Seeds were exposed to red and blue light over a range of intensities at this temperature. The germination percentages obtained under each treatment are shown in Table 1. These results demonstrate that both blue and red light inhibit germination, and that at the lower intensities blue light is more effective.

On the other hand, it has been found in a number of experiments that germination of *Nemophila* seed is not inhibited by infra-red radiation at an intensity of 4,000 ergs/cm.²/sec. From a knowledge of the spectral emission data for 'daylight' fluorescent tubes[4] it can be calculated that in white fluorescent light, at an intensity of 1,200 ergs/cm.²/sec., the infra-red component is approximately 15·6 ergs/cm.²/sec. Thus, it appears unlikely that the inhibitory effect of white light is due to its infra-red content.

These results are not in agreement with the suggestion put forward by Meischke[5], that the germination of seeds of certain species is inhibited by light from a tungsten filament source because the inhibitory effect of the infra-red content overcomes the effect of promotive wave-lengths. The results also contrast with the findings of Baxter-Jones and Bailey[6] for *Lamium amplexicaule*, which tend to support Meischke's hypothesis. Furthermore, it appears that in *Nemophila* seed we have an example of an action spectrum for germination which, because of the greater effectiveness of blue light, is not in accordance with the typical action spectrum elucidated by Borthwick and his co-workers[1], but which is similar to the findings of several Dutch workers[4,7] for the dependence on wave-length for flowering in *Hyoscyamus* and other plants.

In the present investigation it is unlikely that the inhibitory effect of blue light is due to its infra-red component since the light from the fluorescent tubes was filtered through a solution of copper chloride. The infra-red content must therefore have been very low.

It is hoped that in future work a detailed investigation of the inter-relationships between blue, red and infra-red radiation will be carried out.

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