

EFFECT OF VISIBLE LIGHT ON THE BEHAVIOR
OF STORED-PRODUCT INSECTS

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ABSTRACT: Insects that infest stored products respond like many other species to visible light wavelengths ranging from 350 to 770 mm. Responses other than phototactic responses are reflected in many types of rhythmic behavior. In *Anagasta kuehniella*, *Cadra cautella*, and *Plodia interpunctella* visible light influences the development and emergence of adults, the reproductive behavior, and the development of reproductive organs. Adult emergence can be entrained to specific times of the day, and light-dark cycle can be used to regulate oviposition, mating, and the "calling" and the release of pheromone by the females. Also, light, mediated probably through the neuroendocrine system, influences spermatogenesis in male *P. interpunctella* and *A. kuehniella*. The many responses of insects to light provide opportunities for investigation of the physiological mechanisms that can be exploited to alter or manipulate behavior of stored-product insects. Such an investigation would supplement existing physiological, chemical, or biological data and could pinpoint ways to develop or improve control methods.

INTRODUCTION: Studies concerning how light affects insect behavior and development fall mainly into 2 categories. The first includes determinations of physiological mechanisms involved with light perception, and the second, the reactions or behavior of the insects to light. In the latter case, the responses of the insects may be immediate as when insects are attracted or repelled by light, or the response may be delayed and reflected in some form of behavior or development after the light stimulus is removed. Examples of these responses and influences of light on insect development and behavior are numerous and well documented in the literature. Time will not allow an extensive review of this subject; and as we are concerned primarily with stored-product insects, I will limit my remarks to a few specific examples of the effects of light on the behavior or development of some stored-product insects. These include the effects of: (1) light visible to the human eye (390-770 mm), (2) light used alone and not in combination with other factors such as temperature, humidity, or diet, and (3) light when it is continuous or alternated with dark periods.

RESPONSE TO MONOCHROMATIC LIGHT: Insects infesting stored products do not differ radically from other insects in their spectral