An organism's ability to adapt to photoperiodic changes in day-length is an important factor in biological activities, including reproduction. This adaptation to the changing day-length, known as photoperiodism, maximizes reproductive success. The mechanisms of photoperiodic regulation of flowering have been well documented in plants. It is also known that other organisms including Neurospora crassa show photoperiodism. Although N. crassa has been a successful eukaryotic model organism in understanding the mechanisms of measuring the daily rhythm by the circadian clock, the mechanisms of photoperiodic regulation and its relationship to the circadian clock are not well understood. Based on the preliminary data from our laboratory, we hypothesized that there could be different mechanisms of photoperiodism in N. crassa. To test this hypothesis, we will perform the night-interruption experiment. It is known that under equinox conditions (12 hours light:12 hours darkness), the production of protoperithecia, the female sexual organ of the N. crassa, is higher than under the short-day condition (8 hours light: 16 hours darkness). In this study, we examine the critical night length required for fungi to discriminate between short day-light conditions (8 hours light:16 hours dark) and equinox light conditions (12 hours light:12 hours dark). The results of this experiment will contribute to our knowledge of the novel mechanisms through which fungi measure day-length.