

ON THE DEVELOPMENT OF *Aleyrodes proletella* L. IN WHITE CABBAGE CROPS OF THE RIGHT-BANK FOREST-STEPPE OF UKRAINE

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Purpose. To investigate the ecological and biological characteristics of cabbage whitefly development in the Right-Bank Forest-Steppe of Ukraine.

Methods and materials. Field method – determination of flight periods, crop colonization, abundance, and development dynamics of the cabbage whitefly was conducted during 2023–2025 at the farm “Zlahoda” (Kyiv region); laboratory method – identification of the pest. Yellow sticky traps were used for monitoring.

Results. Over the past decade, the development and spread of the cabbage whitefly has posed a threat to Brassicaceae crops worldwide and across all regions of Ukraine. Therefore, research into the characteristics of its development is an essential component for timely detection and protective measures. Based on 2023–2025 monitoring, it was established that the phytophage significantly colonizes and damages brassica crops, causing substantial economic losses: up to 100.0% in Napa cabbage, 88.5% in broccoli, 72.3% in cauliflower, 47.5% and 19.5% in late and early white cabbage varieties respectively, 47.0% in Savoy cabbage, 4.0% in Brussels sprouts, and 3.5% in red cabbage. The calculated average colonization index exceeded 40 for Napa cabbage, broccoli, and cauliflower, and over 15 for late white cabbage varieties. Successful overwintering of the phytophage in open ground, combined with a constant food supply, indicates a high pest reserve, ongoing threat, and highlights its emergence as one of the most harmful species that previously caused no economic damage to these crops. The distribution, colonization, population size, dynamics, timing, and duration of all developmental stages of the phytophage were determined. Development depends significantly on abiotic factors. Colonization of cabbage crops began in late May – 1st decade of June at a sum of effective temperatures (SET) above +10 °C of 173.0–188.0 °C. Adult flight duration during the vegetation period was 134 days in 2023, 130 days in 2024, and 105 days in 2025. Embryonic development lasts an average of 8.5 days (range 6 to 11 days) at average daily temperatures of +22.7–23.0 °C and relative humidity of 65.0–75.0%; larval development averages

18.7 days (minimum 15, maximum 21 days) at average daily air temperatures of +19.1–21.8 °C and humidity of 63.0–75.0%. A decrease in air temperature to +17.5 °C or deficient/excessive precipitation extends egg and larval development times by 3–7 days. The longest period of pest colonization and feeding was recorded in 2023 (134 days), exceeding the 2024 figure by 4 days and 2025 by 29 days. A three-year analysis of SET, mean temperatures, hydrothermal coefficient (HTC), yellow sticky trap captures of adults, and average population density revealed strong consistency with minor deviations, demonstrating high ecological adaptation of the phytophage to the hydrothermal conditions of Ukraine's Forest-Steppe zone. Despite varying hydrothermal conditions—such as sharp daily air temperature fluctuations and precipitation shifts—the seasonal development pattern of the phytophage remained stable, with no mortality observed in harmful developmental stages. The phytophage evades the detrimental effects of drought as adults, eggs, and larvae continuously inhabit the lower side of leaves. Additionally, adults are active primarily in the early morning and after 6:00 PM.

Conclusions: The timing of colonization, egg laying, and larval hatching extended from the BBCH 14 stage throughout the entire growing season and varied depending on weather conditions. Air temperature and HTC were identified as the primary drivers affecting egg and larval development rates. Under higher temperatures and HTC values of 1.3–1.6, development times shortened. The phytophage produces 3–4 generations per season. On average, a single generation develops in 32.5 to 35 days at an average daily air temperature of +18.1...+21.4 °C, HTC of 1.6–2.5, and SET of 307.7–344.4 °C.