Modern green wall systems typically consist of plants held on to the side of a building by a series of plastic planters. The fire safety risks posed by a green wall in the event that they are dryer than expected are not fully understood at this time. To date, most of the fire performance testing has been conducted on properly watered green walls. An experimental program was carried out to investigate the effect that a lack of moisture has on a green wall module’s ability to burn. The first part of the program involved drying out and burning individual leaves and later entire plants, to form a better understanding of how a moisture affects plant flammability. The final stage of the program involved drying out a genuine module in an oven, attaching it to an apparatus designed to replicate a professional installation, and then exposing it to a pilot flame. This test was performed with four modules with different drying times. The plant canopy became partially flammable after 4.2% of the mass was lost due to drying, and fully flammable after 16.7% was lost. The soil was also observed to smoulder during these tests. However, neither the canopy fire or soil smouldering were able to ignite the plastic on their own. A direct impingement of the pilot flame on the lower plastic module failed to spread upward, because the melted plastic dripped away too quickly. However, an identical fire started at the top of the module could spread downward, but the size of the resulting fire was dependant on the soil moisture. Also, the fire was able to puncture the back side of the module and instigate a fire in the cavity between the module and the plaster board wall of the apparatus.