e-GRO Alert

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Identification and Control of Birdeye Pearlwort (*Sagina procumbens*) in Greenhouse Container Production

Birdeye pearlwort (*Sagina procumbens*), also known as pearlwort, belongs to the Caryophyllaceae family. It is a low-growing, moss-like plant that typically behaves as a spreading cool-season annual. However, under favorable conditions, it can also persist as a short-lived perennial. This plant often forms small mounds in nursery containers, though it can also spread out as a prostrate mat (Fig. 1), especially in gravelly areas surrounding the containers.

Figure 1. Birdeye pearlwort growing like a mat. Photo credits: Debalina Saha (Dept. of Horticulture, MSU)

It thrives in environments with consistent moisture, such as propagation benches, flats, and greenhouse floors, where high humidity and regular watering provide ideal growth conditions [1]. In terms of habitat, pearlwort is commonly found in disturbed areas near human habitation, including lawns, roadsides, gardens, seaside cliffs, and pond edges. It can also grow in wetland communities and at the margins of ponds and lakes. Additionally, Birdseye pearlwort has been documented as an occasional weed in lawns [2] and container-grown ornamental plants [3]. In certain ecosystems, such as the subantarctic Marion Island, this species has even been shown to dominate and alter vegetative compositions following past disturbances [4].

Its adaptability to moist conditions makes it particularly troublesome in container production, where it can quickly establish and persist both in greenhouse containers and the surrounding gravel areas. Its resilience and ease of spread have created challenges for the growers, as it competes with cultivated plants for resources and space [5] (Fig. 2).

Distribution: Pearlwort is widely recognized as having origins in Europe [6], with some sources also mentioning Eurasia and North Africa as part of its native range [7]. Over time, the species has spread globally and is now naturalized in temperate regions worldwide, including North America, Asia, Australia, New Zealand, and several subantarctic islands [6],[8],[9]. In the United States, it is present in 33 states and much of Canada [10]. While more common in southwestern British Columbia and southern regions, its presence diminishes further north from the Central Coast. Notably, it grows as far north as 70.9°N in Norway [11].

Biology of Birdeye Pearlwort

Root: Birdseye pearlwort anchors itself using a taproot. In addition to this primary root, the plant also develops rooting stems, which further help in spreading and stabilizing the plant across its growing area. These roots allow the plant to create mats that can cover the ground effectively, promoting its growth in both natural and disturbed environments [12].

Stem: The stems of Birdseye pearlwort are green, hairless, and typically much branched (Fig. 3). These stems grow from the base and either ascend or, more commonly, grow prostrate along the ground. As the stems spread out, they root at the nodes, which enables the plant to form a mat-like structure that enhances

Figure 2. Birdeye pearlwort competing with container-grown Christmas tree seedings grown in greenhouse conditions. Photo credits: Debalina Saha (Dept. of Horticulture, MSU).

Figure 3. Highly branched stems of *Sagina procumbens*. Photo credits: Debalina Saha (Dept. of Horticulture, MSU).

Figure 4. Small inconspicuous flowers of pearlwort.

Figure 5. A magnified single flower with four tiny white petals, which are often smaller than the green sepals that enclose them.

Figure 6. Fruit of Birdseye pearlwort is a capsule which contains numerous minute seeds.

its ability to cover the ground. This branching and rooting characteristic helps it thrive in areas like lawns, roadsides, or gravelly substrates (such as around nursery/greenhouse containers), making it a robust groundcover species [7].

Leaves: The leaves of Birdseye pearlwort are small, about 1 mm wide, hairless, and toothless. They are linear in shape, lacking petioles (stalks), and have a minute, bristle-like tip. Sometimes the leaves are slightly fleshy. The basal leaves, located near the ground, are the longest, measuring up to two-thirds of an inch, and are often arranged in a rosette formation. As the leaves progress up the stem, they become shorter and are oppositely arranged, although they may appear whorled because of the dense leaf clumps that form in the leaf axils [7].

Flower: The flowers of Birdseye pearlwort are quite small, usually less than ¼ inch across, and can be difficult to observe without magnification (Fig. 4). Each flower contains four tiny white petals, which are often smaller than the green sepals that enclose them (Fig. 5). Some plants may exhibit flowers with five petals and sepals, though this is rare. Flowers also bear four stamens with white anthers and a yellowish-green ovary in the center. The flower structure is hairless, and the small size of the flowers allows them to remain relatively inconspicuous. After pollination, the flower becomes nodding, and the sepals close tightly around it, protecting the developing fruit.

The flowers are borne singly or in small clusters at the tips of branching stems or on stalks that arise from the leaf axils. This arrangement ensures that the flowers are slightly elevated above the foliage but still remain small and unobtrusive. The reproductive organs, such as the ovary and stamens, are housed within this delicate floral structure [5],[7].

Fruit and Seed: The fruit of Birdseye pearlwort is a capsule that contains the seeds (Fig. 6). As the fruit matures, it develops four triangular teeth at its tip. These teeth eventually spread open, allowing the numerous tiny, blackish-brown seeds to be released. The sepals, which had enclosed the flower and fruit, spread apart as the capsule matures, exposing the upright fruit. This natural mechanism of seed dispersal is highly effective in aiding the plant to spread in its environment, ensuring that new plants can germinate in the surrounding area, particularly in moist and disturbed habitats [7].

Propagation Method: Birdseye pearlwort reproduces both through seeds and by vegetative means, as its stems can produce root at the nodes, allowing the plant to spread effectively [6]. This species is highly prolific, producing a significant number of seeds that have the ability to stay viable in the soil for more than five years. This extended seed viability enables the plant to establish and persist in an area for long and extended periods [9], [13].

Similar species: Birdseye pearlwort can be easily confused with several other Sagina species including alpine pearlwort (*Sagina saginoides*), snow pearlwort (*S. nivalis*), stickystem pearlwort (*S. maxima* ssp. *crassicaulis*), and western pearlwort (*S. decumbens* ssp. *occidentalis*). However, these species can be differentiated by specific traits. Alpine pearlwort has non-fleshy leaves, five sepals and petals per flower, and petals that are shorter (1.5–2 mm), with sepals that press against the capsule once it opens. Stickystem pearlwort is identified by its longer sepals, which measure 2.5–3 mm, and it also has five sepals and petals per flower. Snow pearlwort can be distinguished by its purple-edged sepals and shorter petals (1.5–2 mm). Western pearlwort is an annual species with non-fleshy leaves, purple-tipped sepals, and it lacks basal rosettes. In addition, all native Sagina species lack the densely clustered stem leaves that are characteristic of Birdseye pearlwort [6],[14].

Management of Pearlwort:

Controlling pearlwort can be challenging due to its rapid growth and establishment. Small seedlings often develop root systems that can resist herbicidal treatments. Effective management typically involves a combination of chemical and non-chemical control methods.

Non-Chemical Control: One of the most effective non-chemical strategies for controlling pearlwort inside greenhouse is to manage irrigation practices, as the plant thrives in over-irrigated, moist environments. By closely monitoring and adjusting irrigation, particularly inside greenhouse and nursery areas, the environment becomes less favorable for pearlwort to establish and spread. For small infestations, manual removal through hand-weeding or digging can effectively manage the weed. Additionally, improving drainage in areas where pearlwort tends to persist can help reduce its presence, making the environment less conducive to its growth [5]. Using alternative irrigation such as drip or micro irrigation can help controlling this weed. The source of irrigation water is also an important factor to consider, as there are higher chances of seed dispersal if irrigating from a pond than from a well. It is recommended to decontaminate your tools, equipment and other machineries to reduce the dispersal of pearlwort seeds.

Also, check the new incoming plant liners and the stock plants which might be infested with pearlwort and can be the source of pearlwort seeds.

Chemical Control: In cases where non-chemical methods are insufficient, chemical herbicides can be used to manage pearlwort outside greenhouses.

Outside greenhouses, preemergence herbicides such as dimethenamid-P and pendimethalin can be applied before pearlwort emergence to prevent its establishment. For post-emergence control of existing infestations, herbicides such as glyphosate may be used, especially for larger infestations [15]. But all these herbicides are not labeled for greenhouse uses. It is important to read the label of the herbicides before any applications.

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