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## Who Said That Pansies Were Easy?

Pansies can be one of the most temperamental beasts in the plant world to grow. A crop that appears to be so simple in appearance can be one of the most challenging for some operators. Pansy seed historically has low germination rates and many smaller operations have come to rely on specialty propagators to provide them with high quality plugs. Pansies will grow well across a wide pH range (5.0 to 6.5), but in areas where the ground water is being drawn from limestone aquifers acid injection may be required to produce a quality crop. In central Pennsylvania, growers frequently deal with water sources with a total alkalinity level of 300 ppm CaCO<sub>3</sub> and a pH in the 7.2 to 7.6 range. Without water treatment (acid injection) it may be largely impossible to grow pansies or many of our other floriculture crops.

If you have not tested your irrigation water source recently please consider doing so immediately. Most of the observed nutritional problems in greenhouses can be linked to irrigation water quality. Once you have test results for your water source you may consider using our e-GRO Grower tool AlkCalc at this link <http://e-gro.org/alkcalc/> to determine how much acid you will need to inject to obtain the desired irrigation water pH for the crop being grown.

Pansies like many floriculture crops will not tolerate elevated soluble salts levels in the growing media. A soluble salt reading in the 30-80 mmhos/cm is considered the target. Soluble salts levels over 100 mmhos/cm in the media will injure pansies. Most growers are usually well acquainted with the specific nutritional requirements of the crops that they are growing so when a problem occurs it can usually be linked to operator error or a malfunctioning fertilizer injector. Since pansies are

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often the first crop introduced into the production area in January, they are often the first crop that may be exposed to a malfunctioning injector. Consider checking the calibration of your fertilizer injector and make sure that it is injecting the proper level of nutrients into the irrigation water.

In my travels as a Commercial Horticulture Extension Educator in Pennsylvania I have found that 75% of the piston-type injectors that I evaluated were not functioning properly leading to either elevated soluble salts or low nutrient levels in the growing media. While replacement parts for these malfunctioning injectors can be quickly sourced, cropping issues may be observed before the injector can be successfully rebuilt. The major take-home point here is to “check injection function” prior to transplanting that first pansy plug.

Pansies are one of the more “salt” sensitive greenhouse crops. Soluble salt levels should be monitored weekly in conjunction with conducting periodic root assessments or evaluations of the pansy crop. When I am troubleshooting a greenhouse operation, I typically select a few samples and then one-by-one invert the pots to remove the plants so a proper root assessment can be made. Root systems that appear to be white and intact are deemed healthy. Root systems that appear gray, blackened, or decayed are considered root rot suspects. Any plant showing any signs of root rot/decay should be submitted to your state’s plant disease clinic or diagnostic lab to determine which pathogen is the causal agent.

Elevated soluble salt levels in growing media can be a precursor to root infection by *Pythium* spp. (*Pythium* root rot) in



Figure 1: Pansies are often the first crop to be grown in the new production year. If there is a fertilizer injector issue, they will typically display injury and/or deficiency symptoms. (Photo by Tom Ford, Penn State Extension)



Figure 2: Many growers use only a single injector when dealing with water quality issues in the greenhouse. Over time some of the integral parts of the injector become worn. (Photo by Tom Ford, Penn State Extension)



Figure 3: Popping pansy plants out of the container to conduct a root assessment or evaluation is a critical step in assessing plant health. (Photo by Tom Ford, Penn State Extension)



Figure 4: Weekly testing of the media and regular monitoring of irrigation water quality and injector function are essential in growing quality plants. (Photo by Tom Ford, Penn State Extension)



Figure 5: Slugs and snails are one of the more common pests that can damage a pansy crop. Molluscicides containing Iron phosphate like Sluggo can be used effectively to manage these pests. (Photo by Tom Ford, Penn State Extension)

pansies. If media soluble salt levels are elevated a grower should consider 1) leaching, 2) to check their injector calibration, 3) to modify their fertility program, or 4) to apply fungicides prescriptively based on the preliminary or confirmed diagnosis.

Pansies typically have very few pest problems when grown in a cool greenhouse. Slugs and snails are one of the more common pests that can inflict damage to pansies. Slugs and snails will chew holes in the leaves, feed on roots, and even eat young seedlings. If the greenhouse floor is covered with weeds/vegetation the likelihood of a slug or snail infestation increases dramatically.

Slug or snail management in the greenhouse starts with good sanitation and weed management. As a best management practice, it is also recommended to keep all pansy flats off the floor and to maintain the area around the pansies dry if possible, to discourage slug/snail activity. Iron Phosphate (Sluggo) is one of the best molluscicides that can be broadcast on the greenhouse floor to control slug/snail problems. Sluggo is OMRI listed and can be used in containers and under greenhouse benches.

Pansies can also be impacted by aphids, fungus gnats, and two spotted spider mites. Usually most pansy pests arrive late in the production cycle as daytime temperatures begin to climb. Biological control using a variety of predators or parasites can be deployed. The successful introduction of biocontrols agents is predicated on pesticide history and the pest infestation level being observed.

Common diseases observed in pansies include damping off, Pythium, Phytophthora, Thielaviopsis basicola, Anthracnose, and Powdery mildew. Mycofungicides and other biologically based products can be deployed to limit infection or prevent disease. Traditional chemical fungicides can be very effective, but growers must be cognizant of resistant issues and should rotate FRAC codes when implementing a disease management/suppression program.

The New England Greenhouse Floriculture Guide which is considered by many to be the preeminent pest management guide for greenhouse growers is now available for purchase at this link:

<https://www.lulu.com/en/us/shop/cheryl-smith-and-rosa-raudales-and-leanne-pundt/new-england-greenhouse-floriculture-guide/paperback/product-8wjeyk.html?page=1&pageSize=4> or accessed electronically for “free” at this link: <http://negfg.uconn.edu/> .

Our e-GRO alerts reach hundreds of growers across the world so growers need to cross-reference any pesticides or PGRs (Plant Growth Regulators) listed in our articles or in the New England Greenhouse Floriculture Guide with your local Extension Educator or regulatory officials to make sure the product that you have selected can be legally deployed for pest management or growth regulation practices in your area of operation. For additional information please contact the author at [tgf2@psu.edu](mailto:tgf2@psu.edu) .

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