

## Preventing Frost Heaving of Late-Planted Perennials

**Philip L. Carpenter**

Carpenter Perennial Farm, 202E 650N, West Lafayette, Indiana 47906

The information presented in this paper is the result of field observations rather than the collection of research data. Also, the concept of using a cover crop for winter protection of newly propagated plant material such as woody plant seedlings was reported at previous I.P.P.S. Eastern Region meetings by Wayne Lovelace of Forrest Keeling Nursery, Elsberry, Missouri. The methods developed by Lovelace were applied to late planted *Hemerocallis* divisions (planted after September 30th) to provide winter protection and prevent "frost heaving" of the crowns. Normally *Hemerocallis* divisions would not be planted in the field after August 30th but in the digging of field-grown *Hemerocallis* plants for fall containerizing there are also surpluses and grade outs left. These plants represent part of the profit that can be made from the crop so it would be advantageous to save these plants if at all possible; hence the late planting in the field. A major problem that can occur when perennials are planted too late for complete establishment takes place is frost heaving, i.e. the movement of the crown to the soil surface due to the alternating freezing and thawing of the soil. The crown of the plant desiccates in the winter and the plant dies.

Between October 1 and 15, 1995 winter rye (*Secale cereale*) was sown on the soil surface at the rate of 2 and 4 bushels per acre in late plantings of several cultivars of *Hemerocallis*. The seed was not covered. Germination of the early sowing was satisfactory but due to lower than normal temperatures early in the season the later sowing did not have complete germination. In the spring when the rye was approximately 15 in. high it was killed with Fusilade 2000 (fluzafop-P-butyl) at the rate of 1 qt per acre. A non-ionic surfactant was added and 20-gal spray acre<sup>-1</sup> was used.

*Hemerocallis* divisions that had protection of complete rye coverage had nearly 100% survival while those that did not have any or limited rye coverage the survival rate was less than 10%. The loss was due to frost heaving of the crowns. Growth of the surviving plants appeared to be normal as the 1996 season progressed.

An added benefit of using winter rye cover is the reduction in weed growth for up to 6 weeks after the rye has been killed. Masiunas et al. (1995) and Smeda and Weller (1996) reported that winter rye cover crops suppressed weed growth in newly planted tomatoes. The suppression was a result of the release of allelochemicals into the soil by the rye residue as it decayed after being killed (Masiunas et al., 1995; Smeda and Weller, 1996). The use of rye cover crops will not solve the weed control problem but it can be a weed control tool to be used with other control methods.

### RECOMMENDATIONS:

- 1) Sow winter rye (*S. cereale*) at the rate of 3 to 4 bushels acre<sup>-1</sup>.
- 2) Use the higher rate to eliminate the need for covering the seed. Cost is approximately \$30 to \$40 acre<sup>-1</sup>.
- 3) Sow prior to rainfall or use overhead irrigation to moisten soil and seed. Germination will start within 48 h.
- 4) Sow seed approximately 3 weeks before average date of the first frost in your area.

- 5) In spring kill the rye with Fusilade 2000 at the rate of 1 qt acre<sup>-1</sup>. Make certain that the perennial crop, if emerged, is on the Fusilade label.
- 6) The rye between the rows can be mowed rather than killed if this fits the management program of the grower.
- 7) Do not use a preemergence herbicide 4 months prior to the sowing of the rye cover crop.

#### LITERATURE CITED

- Masiunas, J.B. , L.A. Weston, and S.C. Weller. 1995. The impact of rye cover crops on weed populations in a tomato cropping system. *Weed Sci.* 43:318-323.
- Smeda, R.J. and S.C. Weller. 1996. Potential of rye (*Secale cereale*) for weed management in transplant tomatoes (*Lycopersicon esculentum*). *Weed Sci.* 44:596-602.