

- f. Return plants to normal growth area.
- g. Repeat the process 1 wk later, except substitute 5 mL Pentac for the Avid in the solution.

The plants will show signs of stress (yellowing of outer leaves), but top fertilizing with an extra 250 mL of double-strength fertilizer/plant/week for a few weeks helps them recover. Return to normal biweekly insecticide treatments.

## Acknowledgments

Support from the Rockefeller Foundation Rice Biotechnology Program, the Texas A&M Office of Sponsored Projects, TAES Research Enhancement Program, and the Texas Advanced Technology Program (Project no. 010366-108, no. 010366-149) is gratefully acknowledged. We thank many present and former members of the lab for their contributions to the techniques described here, especially Michael Battraw and Ginger Stuessy. We also thank M. O. Way and Shannon Pinson, Texas Agriculture Experiment Station (TAES), Beaumont, for advice on rice pest control and plant growth conditions, respectively.

## References

1. Herdt, R. W. (1991) Research priorities for rice biotechnology, in *Rice Biotechnology* (Khush, G. S. and Toenniessen, G. H., eds.), Alden, Oxford, pp. 19–54.
2. Huntley, C. C. and Hall, T. C. (1996) Interference with brome mosaic virus replication in transgenic rice. *Mol. Plant–Microbe Interact.* **9**, 164–170.
3. Sanford, J. C., Klein, T. M., Wolf, E. D., and Allen, N. (1987) Delivery of substances into cells and tissues using a particle bombardment process. *Part. Sci. Technol.* **5**, 27–37.
4. Sanford, J. C., Smith, F. D., and Russell, J. A. (1992) Optimizing the biolistic process for different biological applications, in *Recombinant DNA, Part H*, vol. 217 (Wu, R., ed.), Academic, San Diego, CA, pp. 483–509.
5. Heiser, W. (1992) Optimization of Biolistic Transformation Using the Helium-Driven PDS-1000/He System. Bio-Rad, Hercules, CA.
6. Hoshikawa, K. (1989) The growing rice plant: an anatomical monograph. Nobunkyo, Tokyo.
7. Li, L., Qu, R., de Kochko, A., Fauquet, C., and Beachy, R. N. (1993) An improved rice transformation system using the biolistic method. *Plant Cell Rep.* **12**, 250–255.
8. Shimamoto, K., Terada, R. T., Izawa, T., and Fujimoto, H. (1989) Fertile transgenic rice plants regenerated from transformed protoplasts. *Nature* **238**, 274–276.
9. Toryama, K., Arimoto, Y., Uchimiya, H., and Hinata, K. (1988) Transgenic rice plants after direct gene transfer into protoplasts. *Biotechnology* **6**, 1072–1074.
10. Hayashimoto, A., Zhijian, L., and Murai, N. (1990) A polyethylene glycol-mediated protoplast transformation system for production of fertile transgenic rice plants. *Plant Physiol.* **93**, 857–863.