A Laboratory Exercise to Demonstrate Embryo Rescue

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Summary. A laboratory exercise is outlined and discussed for embryo culture of bean, corn, and pea embryos. Fresh, inexpensive material is generally available for these crop species throughout the year. The exercise gives students experience in embryo excision and exposure to some benefits of embryo rescue. Embryos from the three species are identified easily and can be removed without magnification, and data can be obtained within 3 weeks after culture. Further investigations using embryos are suggested.

A common problem experienced in tissue culture laboratories is contamination. The three species used here have ovules that easily separate from the fruit and smooth seedcoats, which facilitate effective disinfection. Corn ovules are removed easily if the ear is broken in half and the ovaries are removed from the broken end using a scalpel. Having the tissue of interest well-protected by the seedcoat also allows for the severe disinfecting treatment. Uniqueness of each seed makes it possible to place them in the same container for disinfecting and then separating them as the embryos are excised. No contamination was observed in any of the cultures.

The three species have large seed and embryo size, allowing easy handling and embryo identification without magnification. They are also avail-

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able during most of the year, so obtaining relatively inexpensive plant material should not be a problem. They also represent warm- and cool-season crops, which would be of interest if temperature were to be a treatment in further investigations.

Of the three, corn was easiest to excise and pea was most difficult. Corn was easy because it was possible to identify on which side of the seed the embryo was positioned before seedcoat removal, and its seed shape made it easier to handle. Pea was difficult primarily because its roundness made it difficult to stabilize while removing the seedcoat.

A workshop for high school vocational agriculture teachers provided an opportunity to observe how someone with little to no experience could perform the laboratory exercise. All generally did well—no cultures were contaminated and, as expected, they found corn to be easiest and pea the most difficult. At first, they also had difficulty identifying embryos. It would be helpful to have excess seed for practice before actually removing embryos for culturing.

The laboratory exercise described here is only a beginning. It provides the basis for exposing students to embryo rescue techniques and shows some of the benefits of embryo rescue. It also allows for investigation of factors influencing embryo germination and growth (media components and concentrations, light quantity and quality, temperature, and embryo age) and how different species react to similar conditions.

**Literature Cited**


