

Video as a Training/Educational Tool in Plant Propagation Laboratory Exercises

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We are now well into what has been referred to as the information age. Video camera recorders (camcorders) and video cassette recorders (VCRs) are used in many households. People now record on video tape instead of taking moving pictures. This can be instantly played back for checking capture and quality. Videotape has largely replaced movies in the classroom. Numerous commercial tapes are available for plant propagation instruction. Although some of these tapes are well prepared, they are not suited to material available for class use in "hands-on" exercises.

The recent introduction of small, hand-held camcorders makes possible the use of videotapes for individual classes. These camcorders are less expensive and more available to instructors even with modest teaching budgets. Tapes can be tailored to material available and the instructors teaching style to give the students more retention of the presented material. This paper will cover types of systems and equipment needed for taping and presentation of laboratory exercises.

Types of camcorders. Three types of camcorders—Video Home System (VHS), VHS-C(compact), and 8mm—are currently used for home recording. Although the VHS camcorder is used for many home and commercial applications, it is somewhat large and cumbersome for teaching and laboratory use. The advantage of VHS is the tape can be played and edited on the commonly available VCRs. The VHS-C camcorder is more compact and its tapes can be played with a special adapter on regular VHS machines. The standard play tape used in VHS-C can only record for 20 minutes, but this should be sufficient for laboratory exercises. An 8mm camcorder is compact and light weight and 8mm tapes can be purchased to record up to two hours. This camcorder can also be used for playback and editing 8mm tapes, but a small 8mm tape player without a tuner can be purchased for a reasonable amount. This small 8mm VCR makes editing easier and would greatly extend the life of 8mm camcorder tape heads. Any camcorder can direct feed into a VCR for direct recording in a lab or studio situation and save wear on the recording tape head mechanism. I use both an 8mm camcorder and tape player for my laboratory instruction.

A recent check of a video store found all types of camcorders to have models with 8:1 zoom lens with macro capabilities down to size of a 35mm slide picture area. Any camcorder with this lens capability should be sufficient for recording any laboratory exercise.

Monitors. It is practically impossible to tape any demonstration by yourself using only the camera viewfinder. Unless you would like to hire a camera operator, some sort of external monitor will be needed. Any television which allows direct line cabling of the video signal will work. The audio should not be connected as you may get feedback and distorted sound on your recording. Some camcorders have a hot

shoe for mounting a small monitor right on the camera, but these are expensive. I use an older, black and white computer monitor as my video monitor. These are now quite inexpensive and a color monitor is not necessary as most camcorders compensate electronically for all types of lighting and give good color rendition.

Making the Tape. Good photographic technique is important in preparing a demonstration tape. Good lighting and uncluttered background help with the detail needed to communicate well with the students. When you record dark plant material against a light background, the back light switch of the camcorder will often help with detail on the plants. Any camera tripod or copy stand will free your hands for the procedures you wish to show. You should have a script or well thought-out remarks before you turn on the camera. The technique should be rehearsed while watching the monitor until it shows what you want the students to learn. Since this is for your student or employee instruction, it does not have to be a completely finished production. Difficult operations may be taped several times for editing purposes. You probably will edit to a VHS full size tape as this is the common equipment available in classrooms.

Many of us have slides of certain nursery operations. These slides can be taped by projecting on a screen and recording while making comments. Since most camcorders have macro capability you can tape directly from the slide over a light box which will usually give a higher quality recording. Home movies can also be copied from a projected screen image, but copyright laws should be respected with commercial movies.

Advantages of Personalized Videotape. A self-made videotape can demonstrate and have the students complete a laboratory exercise on the same material. Although several commercial tapes are available they may have extraneous material to your educational goals for a particular class time. Since many propagation operations depend on close detailed work, you can show the whole class at the same time. If you demonstrate a particular technique to a class of 20 or more, only 3 or 4 down front pay close attention. The rest are talking or thinking different things. When you show a video tape almost all pay attention. If they did not understand sufficiently, you can rerun the tape until they are satisfied.

Another advantage is when the class is trying a number of different cuttings for a class exercise. The class will not pay close attention to cuttings assigned to other groups. When manipulation of various cuttings are shown on the tape before assignment, the students will pay attention to all of the different techniques since they do not know which they will do for their experiment.

The camcorder is particularly good for showing a whole class small detailed work like embryo extraction or manipulation of tissue-cultured microcuttings. You can zoom in on the manipulations and put on screen what only one or two students could observe closely at one demonstration. If you have a class of 20, this used to mean showing something 10 times or students would have to observe other students. This observation often leads to errors and makes the demonstrating student nervous.

Getting Started. You should visit your local electronics store where knowledgeable sales people can explain various camcorders and taping and editing options. Hopefully, you can get a small teaching grant to help you buy the equipment. You should read the manual carefully and start taping. Although a good photographer

will also probably do well with a camcorder, this technology is in many ways easier than photography. The camcorder can automatically capture an image in almost any light situation, even very low ones. It automatically compensates for color variances in lighting to give an acceptable color image. Focus is automatic, although a bit slow. Finally, you have instant feedback to see if your taped material is usable. If it is not usable, you can try again.

Educational and Other Benefits. The students will benefit from material directed to their instant "hands-on" experience. We are now teaching a generation that gets much of their information from television. Although I firmly believe a college student should be able to learn and interpret information from books, a video helps with practical manipulative skills needed for a profession like plant propagation. Video certainly makes life easier teaching "hands-on" techniques to several students at a time. Commercial propagation operations with large crews may also consider video equipment to bring everyone to the same level of competence. Video can also help review seasonal techniques from previous years for increased early season efficiency.