Technical Notes:

A Tool for Sampling Flat Jointed Opuntia

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Abstract

A section of automobile exhaust pipe was machined to produce a tool for sampling prickly pear. The tool provides a method to quickly and easily remove a section of the cladophyll. This method produces samples with a uniform surface area.

Recent studies involving plains pricklypear (*Opuntia polyacantha* Haw.), Texas pricklypear (*O. lindheimeri* Engelm.), and brownspine pricklypear (*O. phaeacantha* Engelm.), presented a problem of collecting plant material of a uniform size for analysis. Studies involving chlorophyll, carbohydrates, moisture percentage, and wax accumulation led to developing a tool which would quickly and easily remove a section of the cladophyll having a uniform area. This report describes a device that fills these requirements.

Methods

A section of automobile exhaust pipe with an outside diameter of 3.8 cm (1.5 in) and an inside diameter of 3.5 cm (1.4 in) was cut into lengths of approximately 20.3 cm (8 in). These short sections

Fig. 1. A section of exhaust pipe in a four jaw chuck of a metal lathe after machining procedure.

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were chucked into a metal lathe. The pipe end was then machined smooth to remove any unevenness caused by cutting the pipe into smaller pieces. Because exhaust pipe is manufactured by rolling flat metal into a cylinder and welding the seam, it was necessary to machine the inside and outside surfaces of the pipe back several inches from the end. This removes any ridges caused by welding and also makes for a perfectly round tube. Next, the end of the tube was beveled to make a sharp edge on end of the pipe (Fig. 1). The sharp edge may be maintained by using a small fine cut metal file.

Results and Discussion

Samples of the pricklypear cladophyll were taken by pressing the sharp edge of the tool into the pad and twisting the tool, using a wood block as a backstop. This method resulted in a cylindrical plug with an area or volume that could be mathematically calculated (Fig. 2). The cored sample was removed by using a wood

Fig. 2. Cactus cladophyll with a sample plug removed.

dowel inserted in the opposite end of the tool pushing the plug out into a container. This method eliminated handling the sample and being injured by the spines or small glochids.

In summary, the tool provided a quick and easy method to obtain samples with identical surface areas. Samples were taken from both field and greenhouse grown plants with similar ease and consistency. Automobile exhaust pipe was selected because of availability; however, other materials such as aluminum tubing, plumber's pipe, or electrician's thin wall pipe may be used with similar results. The area of the sample may be varied by selecting tubing with smaller or larger inside diameters. This allows for individuals to select the optimum surface area for their sampling needs.