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COMPANION GRASSES IN NURSERY PRODUCTION

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We at Forrest Keeling Nursery are involved in our third year using companion grasses as an integral part of our field-grown seedling production program. Introduction of selective grass herbicides has rendered this program a valuable asset to seedling production.

Primary reasons for using companion grasses at Forrest Keeling have been: erosion control; stabilization of mulching materials; prevention of crusting of mulch materials; and protection from a number of spring weather conditions including torrential rains, desiccating winds, and late spring frosts.

GRASSES USED AND THEIR CONTROL

After experimenting with several grasses we have determined the best two for our program are annual rye grass for summer and fall-seeded nursery crops and oats for spring-seeded nursery crops. It is important to note that fall seeded oats, as historically practiced in the nursery industry, fail to

correct the crusting condition. In addition, fall seeded oats give no spring protection because they are killed during the winter and leave only a few remnants by spring when protection is vital. Conversely, annual rye grass, being a winter annual, begins growth and offers the protection needed.

In open field seedling production, the most critical spring period occurs at the time of seedling emergence and continues until true leaves appear and seedlings are able to fend for themselves. At our nursery in northeast Missouri, this critical period lasts about 30 to 45 days and normally ranges from early April through mid-May. This particular time span presents precarious weather conditions including late spring frosts, torrential rains, and high desiccating winds usually in combination with low humidity. Any of the above conditions are capable of completely decimating an emerging seedling crop. Our use of companion grasses has added a major safety factor during this critical production period.

Managing the use of companion grasses has been made possible by the introduction of a number of selective grass herbicides. Our program currently is designed around the use of the herbicide Poast. It allows us to kill the companion grass at exactly that stage of growth when it converts from a protection crop to a competition crop. Poast gives us a near perfect grass kill with no apparent injury to any of our 80 kinds of deciduous tree and shrub seedlings.

SPRING SEEDING WITH OATS

Spring seeding of nursery crops presents an entirely different situation than summer or fall seeding and necessitates a need for a different approach to the use of a companion crop. A faster germinating companion crop is needed that will create a microclimate that gives quick protection to the germinating tree and shrub seedlings. We have found oats to be our best spring companion crop. Oats give us immediate and almost complete seed germination and thus provides protection when most needed.

Oats are seeded with a Gandy air flow seeder directly on our prepared seedbeds at the time we sow our nursery crop. We feel a density of 10 to 15 oat plants per square foot gives optimum protection. To achieve the desired density we seed at a rate of 20 seeds per square foot. The entire production field, including pathways, turning areas, and all other open areas is seeded.

SUMMARY

The use of companion crops has proved to be an asset to our overall seedling production program. The use of oats seed-

ed in spring has filled an important gap in our companion crop program. This is particularly noteworthy because historically oats have been used as a fall protection crop in nursery production. The availability of new selective grass herbicides has opened a host of beneficial uses for this old "standard" companion crop.

CHARACTERIZATION OF THE ROOT-PROMOTING ACTIVITY IN WILLOW EXTRACTS[1]

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Abstract. Using the mung bean rooting test, fractionation, and chromatographic techniques, attempts were made to identify and characterize the nature of the root promoting substances in crude and partially purified willow extracts. Clarified extracts increased the rooting response in comparison to crude extracts. Rooting activity was greater in extracts from plant materials collected in winter months than in those of the summer months. There was a positive correlation between root number of mung bean cuttings and total phenol content in seasonal willow extracts. Water extracts or their fractions showed greater root promoting activity than those of ethylacetate counterparts. The results suggest that water soluble phenolic and indolic compounds are major root-promoting substances in willow extracts.

INTRODUCTION

Kawase (15) obtained strong root promoting activity on mung bean (*Phaseolus aureus*) by applying centrifugal diffusate of willow (*Salix alba*). The diffusate was strongly synergistic with indoleacetic acid (IAA) in inducing rooting of mung bean cuttings. Kawase (16) also extracted with water, rooting substances from *S. alba* similar to those found in the centrifugal diffusate. He suggested that the willow extracts contained large amounts of endogenous cofactors, as yet unidentified, and the right balance of hormone and rooting substances capable of improving rooting. Water-soluble substances from many

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