

currently being tried that needs only vacuuming.

Perhaps the crystal ball will show that wheel marks will no longer be seen after the turf has been cut with sonar principle equipment.

There is no need to worry about clipping accumulation or dew as air cushion machines take care of these problems as well as offering swift and "rutless" transportation. Helicopters

are made practical for fungicide, insecticide, herbicide and fertilizer applications if indeed our new improved plants require them.

These are only a few of the dream mechanisms being visualized. Are they unreal? I don't think so. Today's technology won't let them be unreal. The Saturn rocket and Apollo capsule were in the crystal ball only a few years ago. Today, man has almost reached the moon.

# Pesticides for Warm Season Grasses

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## FUNGICIDES

In the South, fine leaf bermudagrasses are used mainly for greens and very little fungicide is used in a preventive disease control program. A preventive program is used when greens are overseeded, but it is not as efficient as it should be. A curative program on overseeded greens is followed in most cases, but not always with satisfactory results.

A fungicidal program has a wide range of cost per square foot. The lower cost of fungicide per 1,000 square feet is usually between 48¢ to 55¢ whereas the upper range of cost will run between 95¢ to \$1 per 1,000 square feet per treatment. A preventive program will cost more than a curative one; the final figure depending on the choice of fungicide. However, the resulting better turf will offset the cost increase.

One disease complex causing concern with bermudagrass is spring dead spot. When a green is lost, it may cost as much as 20¢ per square foot for resodding. This is about \$200 per 1,000 square feet, or \$2,000 for 10,000 square feet of green. Leaf spot is probably found more often than any other fungi on bermudagrass. In most cases, this foliage disease is easy to control.

## HERBICIDES

Herbicides may generally be divided into pre-emergence and post-emergence cata-

gories and also as selective or non-selective types. Selectivity is based on physiological, morphological, translocation, and absorption differences between plants.

The physiological plant differences are probably least understood, and it involves the internal chemistry of the plant. Some compare it to the resistance or susceptibility of humans to certain diseases.

Translocation can occur through the xylem, phloem, or between cells. The xylem tissues move plant nutrients from the roots to other plant parts, and the phloem tissues move manufactured food from the leaves to other parts of the plants, mainly roots, fruit, and storage areas.

Morphological plant differences refer to size, shape, leaves, and stages of growth. Weeds are the result of poor turf quality, not the cause. A healthy turf offers the best control. Herbicides will do an excellent job for you where they are needed and if they are properly used. Unfortunately, mis-use during the past several years in the form of poor distribution has been most noticeable.

There is a wide range in "cost per acre" between pre-emergence and post-emergence materials. Good results have been realized with either type when properly handled. The bermudagrasses are especially tolerant of the arsenate products, such as disodium methyl arsenate and monosodium methyl arsenate.



*Application rates are established by extended research.*

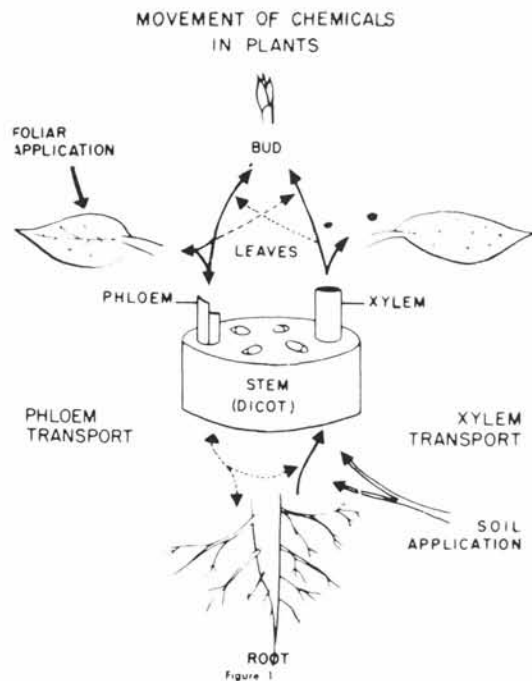
At the 1968 Southeast Weed Conference, the following estimated economic losses due to weeds in turf were presented. The figures do not include golf course turf. If they did, the figures would be much higher.

Be sure you know your weed problem and the chemicals that will eliminate them without harming your turf. This is the first step in effective and economical weed control.

### INSECTICIDES

Warm season grasses are constantly being attacked by insects. The farther south one goes, the larger the insect population, the more insecticides required and the greater the problems.

Most insect problems are controlled by the curative method. When insects are observed, grass is immediately sprayed. Various symptoms are associated with each insect, but some are so similar to other problems caused by disease, drought and nutrient deficiency that one must beware of a snap judgment. This is why experience and knowledge of the problem at hand is so important before control is satisfactory.



*Translocation of herbicides can occur through the xylem, phloem, or between cells.*

The one insect that seems to be a constant problem is the sod webworm. Fortunately, there are numerous insecticides that do a marvelous job in controlling them. One of the most used procedures and probably the best method of control is to spray the foliage in the afternoon, leaving it on overnight, and syringing it off the next day.

Insects, especially sod webworms, first seem to become a problem on the best turf in the neighborhood. No doubt this is due to the better turf color. Moths lay eggs where the life cycle will have the best chance for

completion, and this, of course, is in better turf.

Bermudamite damage is now being observed more frequently in Florida. There is usually a disease complex associated with it. A fungicide can be used in conjunction with an insecticide to control both problems. Of course, the fungicide, insecticide, and the water used for the solution have to be checked to see if they are compatible. In some cases, a synergistic effect occurs when two chemicals are used and better control is achieved.

**CATEGORY I – ECONOMIC LOSSES DUE TO WEEDS**  
**TABLE 15. ESTIMATED LOSSES DUE TO WEEDS IN TURF**

(Total Values Expressed in Thousands of Dollars, Acres in Thousands of Acres)

		ARKANSAS	GEORGIA	KENTUCKY	LOUISIANA	OKLAHOMA	TEXAS	VIRGINIA
Cost of Herbicides	a. Acres	20	160	200	30	100	110	125
	b. Cost/A	\$ 7.00	8.00	10.00	20.00	20.00	25.00	20.00
	c. Total Value	\$ 140	1,280	2,000	600	2,000	2,750	2,500
Loss in Quality	a. Acres	15	500	NA <sup>1</sup>	NA	100	250	300
	b. Cost/A	\$ 10.00	4.00	"	"	50.00	50.00	5.00
	c. Total Value	\$ 150	2,000	"	"	5,000	12,500	1,500
Loss in Land Value	a. Acres	15	NA	NA	70	NA	Questionable	NA
	b. Cost/A	\$ 10.00	"	"	50.00	"		"
	c. Total Value	\$ 150	"	"	5,000	"		"
Cost of Mechanical Control	a. Acres	NA	NA	NA	NA	60	20	335
	b. Cost/A	"	"	"	"	10.00	20.00	10.00
	c. Total Value	"	"	"	"	600	400	3,350
<b>TOTAL VALUE</b>		<b>\$ 440</b>	<b>3,280</b>	<b>2,000</b>	<b>5,600</b>	<b>7,600</b>	<b>15,650</b>	<b>7,350</b>

<sup>1</sup> Not available or not applicable