

NOT FOR THE BIRDS

Morkit, a chemical bird repellent, solves the most difficult problem in direct-seeding longleaf pine.

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Morkit, a dull gray powder that is repellent to birds, may remove the greatest obstacle to successful direct seeding of longleaf pine.

In the past, many Louisiana landowners have tried to restock their longleaf lands by sowing pine seed directly in the field--in contrast to the usual procedure of planting 1-year-old stock grown in a nursery. Most of these direct-seeding attempts failed, largely because there was no practical way of preventing birds from eating the seed.

Resident and migratory birds concentrate in November, when conditions are best for sowing, and usually cause heavy losses or even complete failure in a few weeks. Patrolling the seeded area during the germinating period reduces bird depredations, but it is expensive and never fully effective. A satisfactory bird repellent that can be applied to the seed would make seeding more reliable and reduce the quantity of seed required to establish a stand.

Tests Give Excellent Results

The Alexandria Research Center of the Southern Forest Experiment Station, working in cooperation with the U. S. Fish and Wildlife Service, has been seeking such a repellent for several years. One of the first tasks was to find a sticker or adhesive--a substance that would make repellents adhere to the seed. The Fish and Wildlife Service solved this problem by suggesting asphalt emulsion, a roofing compound that resists weathering and does not harm the seed.

A long series of tests were conducted with various chemicals and colored seed coatings, mostly suggested and furnished by the U. S. Fish and Wildlife Service. At Alexandria, coloring the seed failed to protect it, even though certain colors have been found highly repellent in other regions of the country. The chemicals most effective were two anthra-

quinone compounds, Morkit and sublimed synthetic anthraquinone.^{1/} Caged meadowlarks repeatedly refused to eat seed coated with these substances.

Anthraquinone is used in the manufacture of photographic formulae, dyes, and laxatives. Morkit, a mixture of this chemical and inert ingredients, is manufactured in Germany specifically as a bird repellent. It has no distinctive taste or odor, and the manner in which it acts to repel birds remains to be discovered. It is not known to be harmful to livestock, wildlife, or humans. There was no sign in any of the tests that it caused the death of birds.

In the fall of 1953, after the trials with caged birds, longleaf pine seed coated with Morkit and the synthetic preparation was sown on 1/4-acre test plots near Alexandria. Sowing rate was the usual one of 3 pounds (about 12, 500 seeds) per acre. The seedbed was a 1-year grass rough. Sowing was deliberately delayed until December, when birds would be numerous. The plots were not patrolled.

The test was a distinct success. Seed treated with Morkit yielded 4, 500 seedlings per acre, and untreated seed only 195. The synthetic anthraquinone, which was tried in a location different from the one where Morkit was used, gave 3, 778 seedlings per acre as against 1, 778 seedlings for untreated seed. Meadowlarks and several species of sparrows were the chief seed eaters. They took more than half of the untreated seed, but ate only 6 percent of that coated with Morkit and 9 percent of the seed treated with the synthetic anthraquinone.

In November 1954, a similar study was conducted to try Morkit and Quinizarine, another commercial anthraquinone compound. Low rainfall during November and December prolonged the germination period, giving birds a greater opportunity to take seed. The two chemicals proved about equally effective, each yielding approximately 3, 000 seedlings per acre. Untreated seed produced only about 250 seedlings per acre, since the birds ate 90 percent of the seed in 1.1 days.

In 1954 also, the Hillyer-Deutsch-Edwards Lumber Company of Oakdale, La., cooperated in testing Morkit on about 200 acres. Sowing was done on a light rough in late November. Only treated seed was used, so no comparison with untreated seed was obtained. Despite dry, severe weather conditions during the germination period, the seedling stand averaged 3,156 per acre with 76 percent stocking. Although many species

^{1/} / The authors are grateful to John Kuprionis of the Louisiana Polytechnic Institute for suggesting Morkit and for furnishing the initial sample. The U. S. Fish and Wildlife Service suggested the other anthraquinone compounds.

of birds were observed in large numbers on this area, seed losses to birds were negligible. Stomach analyses of birds collected on the area showed that only a small proportion had eaten seed, and none in the quantities found in previous tests with untreated seed.

These tests are, of course, not conclusive. More trials will have to be made before all the capabilities and limitations of Morkit are known. Meanwhile, early results are so promising that many landowners are interested in trying the chemical themselves during the fall of 1955.

Suggestions for Using Morkit

Although the anthraquinone compounds so far tested have shown excellent repellent properties, Morkit is the least expensive. It costs 40 cents per pound, in contrast to sublimed synthetic anthraquinone for 88 cents and Quinizarine at \$2. 15.

Longleaf seed can be coated with Morkit for 15 cents a pound. This cost includes all labor and materials, including the asphalt sticker. ^{2/} One pound of Morkit is enough for 4 pounds of seed. The asphalt emulsion costs about a dollar per gallon; one part by volume is mixed with three parts of water, and 6 gallons of the mixture will treat 200 pounds of seed. Labor costs will vary, but two men can treat about 800 pounds of seed daily.

The necessary equipment can be easily made from two 55-gallon steel drums. The picture shows the rig built by the HillyerDeutsch-Edwards Lumber Company. The drum on the right has the top removed and is used to apply the sticker. The fine-meshed, heavy wire basket is about 20 inches deep. It holds the seed (Photo-La. Forestry Comm.) when it is dipped into the sticker.



^{2/} Not all asphalt roofing compounds are suitable as stickers. The asphalt must have a clay additive. One satisfactory compound is C-13-HPC, manufactured by the Flintkote Company.

The other drum is used to apply the Morkit. It is mounted on an axle so that it tumbles end-over-end when the crank is turned. A single set of baffles is welded inside the drum to help mix the seed and Morkit. A removable, tight-fitting cover is also needed.

The asphalt sticker is first mixed with water in the dipping drum; it has to be stirred until all lumps disappear. Then about 35 pounds of seed (with wings removed) is put into the basket and lowered into the sticker. In 2 or 3 minutes, when the seed is thoroughly coated, the basket is pulled up and the surplus sticker allowed to drain off.

Next, the seed is emptied from the basket into the tumbler and Morkit is poured over it and mixed in with a wooden paddle. The cover is then closed tightly and the drum rotated for about 3 minutes, after which the coated seed is spread out on a canvas to dry for several hours. It can be sown as soon as it is dry enough to handle.

Although Morkit seems very effective against birds, it does not repel other seed-eaters. This means that safeguards against rabbits, rodents, and other animals must be maintained. Moreover, until Morkit is tested more fully in large-scale operations, the recommended longleaf seeding rate of 3 pounds per acre should not be reduced.