



Winter Scene of the Bermuda winter putting turf study at Newport News, Virginia.

WHAT SEEDS ARE AND DO

By VICTOR R. BOSWELL

Extracted from "The Yearbook of Agriculture—1961." This yearbook deals with many facets of a subject which holds an appeal for all of us. It is available from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. The price is \$2.

Seeds are many things. Above all else they are a way of survival for their species. They are a way by which embryonic life can be almost suspended and then revived to new development, even years after the parents are dead and gone.

Seeds protect and sustain life. They are highly organized fortresses, well stocked with special supplies of food against long siege.

Seeds are vehicles for the spread of new life from place to place by the elements and by animals and people.

Seeds are food for man and animals and other living things.

Seeds are raw material for the fashion-

ing of myriad products by people.

Seeds are wealth. They are beauty.

They are a symbol—a symbol of beginnings. They are carriers of aid, of friendship, of good will.

Seeds are a source of wonder. They are objects of earnest inquiry in man's ceaseless search for understanding of living things.

Seeds of unwanted kinds are as enemies; they are a source of trouble.

Seeds are many things, but everything about seeds—their numbers and forms and structures—has a bearing on their main purpose: to insure continuing life. Seeds are containers of embryonic plants, the embryos of a new generation.

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Viable Seeds Probably Are Never Completely Inactive

Vital processes go on as a seed awaits conditions favorable for germination and plant growth. If we knew how to arrest or suspend all these processes completely, it would be possible theoretically to retain viability indefinitely. We do not know how to do this.

Activity within the seed may be so low that we cannot measure it by any known method. In time, however, if the seed does not encounter conditions that will permit it to grow, unidentified substances become exhausted or they deteriorate; germinating power is lost, and the seed dies. Warmth and moisture hasten the exhausting life processes and shorten the life of the seed. Dryness and cold slow down activities, conserve vital substances, and protect the delicately balanced systems within the seed.

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Unwanted Plants Make Seeds

It seems that undesirable or unwanted plants generally are more prolific seed producers than most of the crop plants that we strive to grow. One investigator estimated that one large tumbling pigweed produces more than 10 million seeds. Many kinds produce 100 thousand to 200 thousand seeds per plant.

Weeds are the pests they are partly because they produce so many seeds. More than that, though: The seed and the plants that grow from them have a remarkable capacity for survival. Reproductiveness and survival value have evolved to a high level by natural selection. Seeds of many weeds are such potent survivors and successful travelers that their species have become nuisances over much of the world.

Farmers and gardeners must contend with weeds that arise from seeds. They appear to come suddenly from nowhere—or everywhere. They arrive unnoticed by air, by water, by animals, and by man's devices.

Earlier arrivals have accumulated in the soil and lie there waiting for the husbandman to stir them up to the surface, where they seemingly explode into growth. One investigator recovered 10 thousand to 30 thousand viable weed seeds in patches of soil about a yard

square and 10 inches deep. Various kinds of seeds kept dormant a long time by their respective mechanisms persistently produce successive waves of noisome seedlings each time the soil is cultivated.

Weeds thus continue to appear although the grower has not allowed a parent plant to produce seed on the site for years. Survival value! Many weed seeds will survive in the soil 20 years and some for longer than 70 years.

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Many seeds are so small that their beautiful features escape us. Many others, although large enough to see easily, are such common, everyday objects that we do not really see them. They are, however, worth our careful observation.

The first and most obvious beauty in most true seeds is in the perfection of their simple forms. Their outlines or silhouettes exhibit endless variations in the curve of beauty. In their entirety we

COMING EVENTS

- September 20-21
Missouri Second Lawn and Turf Conference
University of Missouri
Columbia, Mo.
- September 26
St. Louis Field Day
Westwood Country Club
Clayton, Mo.
- September 27-28-29
Northwest Turf Association Conference
Washington State University
Pullman, Washington
- October 2-3
Utah-Idaho Turf Conference
Idaho Falls Golf Club
Idaho Falls, Idaho
- October 5-6
Rocky Mountain Turfgrass Conference
Colorado State University
Fort Collins, Colorado
- October 9-10
New Mexico Turfgrass Conference
New Mexico State University
University Park, N. M.
- October 18-19-20
Central Plains Turfgrass Conference
Kansas State University
Manhattan, Kansas
- November 16-17
Arizona Turfgrass Conference
University of Arizona
Tucson, Arizona
- November 27-30
1961 Annual Meetings of the American Society of Agronomy and the Soil Science and Crop Science Societies of America
Sheraton-Jefferson Hotel
St. Louis, Missouri

find wide ranges of proportion and different graceful and simple masses that are pleasing to look upon.

The sphere is a thing of beauty in itself, although quite unadorned. Artists have tried to produce nonspherical "abstract" forms that possess such grace and proportion as to call forth a satisfying emotional or intellectual response in the beholder. Some of the nicest of such forms lie all about us, unnoticed, in seeds. The commonest are such basic forms as the sphere, the teardrop, the ovoid and other variations of the spheroid.

Some of these curving shapes are flattened, elongated, or tapered in pleasing ways. Sometimes they are truncated or sculptured into somewhat rough and irregular form. They may bear prominent appendages, such as wings, hooks, bristles, or silky hairs. Most seeds show a smooth flow of line and surface that is perfection itself.

The details of the surface relief of many seeds are even more beautiful in design and precision than the mass of the seed as a whole. Often you can find minute surface characters of surprising kinds. Surfaces that appear plain and smooth to the unaided eye may be revealed under a good hand lens to have beautiful textures.

Surfaces may be grained or pebbled. They may have ridges like those of Doric columns. They may bear geometric patterns in tiny relief, forming hexagons, as in a comb of honey, or minute dimples may cover the surface. Irregular surface patterns of surprising beauty sometimes appear under the lens. Surfaces may be dull, or highly glossy or anywhere in between.

Last but not least in the beauty of seeds are their surface colors. They may be snow white or jet black. The color may be a single solid one, or two or more may be scattered about at random. Colors may form definite patterns that are distinctive and characteristic of the species and variety. The colors may be almost any hue of the rainbow—reds, pinks, yellows, greens, purples—and shades of ivory, tan, brown, steely blue, and purplish black.

Look for all you can see with the unaided eye. Then look at smaller seeds

and the surfaces of large seeds with a good hand lens. You will be delighted with what you find.

There is still another beauty, a potential beauty in seeds, that can be seen only as the seed fulfills its ultimate purpose—the production of a new plant possessing its own beauty. This is perhaps the greatest of all: Beauty of general form; grace of stem; the shape, sheen, and color of the leaf; and finally the loveliness of the flower or the lusciousness of a fruit. The cycle is complete, and so we are back to the beauty of a seed.

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From prehistoric times man has understood the role of seeds. Ancient languages, ancient cultures, and our own contain many words and concepts based on this understanding. The Bible contains several such examples, including the parable of the sower, the use of the word "seed" to mean offspring or progeny, and references to good and bad seed.

Our language contains both common and technical terms involving "seed," although the meanings are quite unrelated to the subject of plants.

The meanings recognize, however, some metaphorical connection in one way or another. "Seed is a noun, an adjective, and a verb."

Watermen speak of seed oysters, seed pearls, and seed fish. The optician speaks of seeds in glass. The chemist seeds a solution with a crystal to induce crystallization. We speak of the seed of an idea or a plan.

"SEEDS ARE EVER A POSITIVE AND CREATIVE FORCE. Seeds are the germ of life, a beginning and an end, the fruit of yesterday's harvest and the promise of tomorrow's. Without an ample store of seeds there can be no national treasure, or no future for a Nation."

—Secretary of Agriculture
Orville L. Freeman