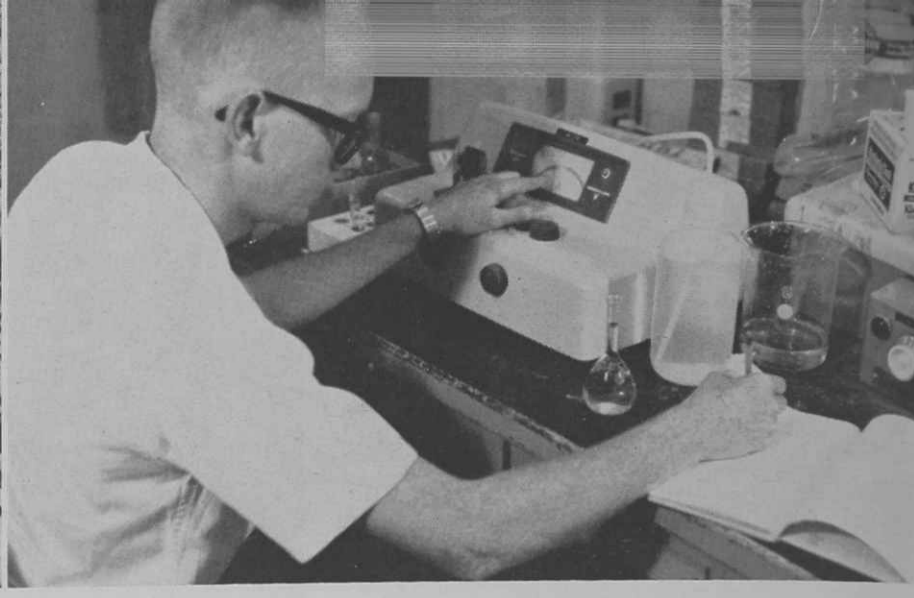




FIRST PLACE TO LOOK (in photo at left) is in the soil, "the manger or feed bunk of growing plants." Soil samples from various places in a field are taken for analysis in the labora-



tory (right) where both soil and plant samples are analyzed, and where content of nitrogen and other nutrients is determined.

In Commercial Vegetable Growing

RESEARCH CAN CUT PRODUCTION COSTS

By J. H. Park, W. D. Pew, and B. R. Gardner

Interest in a vegetable research program has recently been shown in Yuma County because of the growing concern over ever-increasing costs of production. The Horticulture and Agricultural Chemistry and Soils Departments have teamed up to carry out a series of tests in an attempt to reduce costs of vegetable production.

Not unlike the successful dairy or beef farmer, who frequently checks the feed mangers to see if his animals are utilizing their feed, the vegetable grower must also determine the effectiveness of all his cultural programs in crop production.

Obviously this is a far more difficult situation in the case of vegetables than for animals because of the less conspicuous means of making appropriate determinations. Nevertheless efforts are currently being made in this program to provide the growers with a more tangible and realistic means, along with easier ways, of evaluating plant responses to their soil environment. To this end the emphasis is being placed on an adequate

and dependable soil and tissue testing program as the key to measuring such responses.

It's Not So Simple

Tests have been completed wherein the first attempts have been made to measure uptake and utilization of soil nutrients by lettuce. Yet, in making a realistic evaluation of these data and findings, other factors often complicate the picture. Thus a realistic or dependable measurement is not easily made.

Aside from the influence of such production practices as fertilization, irrigation, tillage, weed control and similar activities, the specific relationships to these by the plants become very real in such evaluations.

Is the manger still full, or is it empty, and should additional materials be given to satisfy the requirements of the plants of the present crop or those of the subsequent crop? Certainly the tried and proven adage that indicates that properly managed cultural practices will enable the plants to more fully utilize the available moisture and plant nutrients and minimize the complicating influences is applicable.

Too Much Is Too Much!

An examination of what can happen when just one factor in the cultural program is improperly managed

is pointed up when a grower either knowingly or unknowingly makes too frequent applications of irrigation water. Such activity serves only to reduce or make more shallow the root systems of the plants and thus minimize the chances of the plants to reach their genetic capacity in production.

Plants with such a root system not only will have their capabilities reduced, insofar as water absorption is concerned, but also their ability to take up plant nutrients. With this situation having been developed, the grower is faced with the need for continuous frequent application of both water and fertilizers to keep the plants growing properly. Costs in production are thus sharply increased in both of the areas of amounts of water and its application, and fertilizers and their application. Many other indirect effects could be cited to further complicate the picture, such as leaching of plant nutrients and aggravation of soil compaction that results from such practices.

With a little thought on the part of the reader, if he visualizes the problem, he could readily see many of the subordinate complications that could cloud the picture even more.

Study Various Proportions

The current program has been designed and is to be adjusted as data are collected, so as to create situations and sets of circumstances to best

(Continued on Next Page)

J. H. Park, member of the Horticulture Department, is in charge of the commercial vegetable program at the Yuma Experiment Station. W. D. Pew is horticulturist and also superintendent of the Mesa Experiment Station. Bryant Gardner is a soils scientist at the Yuma Experiment Station.

Cultivating Our Garden

By Arthur H. Beattie

EDITOR'S NOTE: When Dr. Arthur H. Beattie, professor of Romance Languages and Director of The University of Arizona's Honors Program, addressed the initiation banquet of Gamma Sigma Delta, honorary society for agriculture, many staff members came to us suggesting that the beauty of prose and thought in this address should be brought to the readers of **PROGRESSIVE AGRICULTURE**. Reading a copy of Dr. Beattie's talk convinced us this should be done. With his permission, the talk is being divided into portions, to be published in a series of issues. Also, some of the talk is being omitted. We hope readers of the talk will enjoy it as much as did those who first heard it.

Few stories of the modern world have been so widely read as Voltaire's *Candide* which first appeared at Geneva, Switzerland, in 1759. Although promptly condemned and ordered to be burned, the little work enjoyed a fantastic success, and was actually reprinted more than 40 times in the remaining 19 years of its author's life. It can be read merely as a hilarious parody of novels of adventure, filled with satirical sallies against the pretensions of the minor German nobility, against the military spirit, against the Jesuit order, against the Spanish Inquisition, against the injustice of kings and courts, and against a host of social evils.

But *Candide* is essentially a refutation of the so-called "optimism" of the philosophy of Leibniz. It has the forthrightness and inevitability of a mathematical demonstration. It is a clear and relentless proof, by the process of reduction to the absurd, of the falsity of the Leibnizian doctrine that "All's for the best in the best of all possible worlds."

(Continued from Previous Page)
study and evaluate the efficiency and effectiveness of lettuce and cantaloup plants in utilizing nutrients, either native or applied, under varying moisture level conditions. In short, are these plants cleaning up their mangers or are they being pre-

"Que Sera, Sera"

There is, of course, no more depressing and no more demeaning concept of man and his fate than to believe that whatever happens is part of a divine plan, and that it is therefore vain to seek in any way to modify the course of events. "All's for the best in the best of all possible worlds," or, in Alexander Pope's phrasing, "Whatever is, is right," may have an appeal for the privileged few in an aristocratic society, eager to preserve for their own advantage the *status quo*, but such a doctrine fosters the perpetuation of all the evils in that society. Voltaire is too much a reformer ever to accept the notion that disease, poverty, discrimination, prejudice, persecution, and war must be passively accepted as a necessary and divinely created part of our condition.

Dr. Pangloss, the ponderously stupid professor satirized by Voltaire, continues to the end, after an unbelievable series of tragic misfortunes, to repeat, with only slight conviction we may be sure, that "All's for the best in the best of all possible worlds." *Candide*, who has found some degree of security and peace on the small plot of ground he now works with his companions, cannot agree.

One of his company sets forth the reasonable and honest claim that the only way we can make life endurable is to keep busy and not seek to fathom its meaning. And *Candide*, to silence once and for all the parroting of his meaningless formula by the pedantic Dr. Pangloss, provides the closing line of the tale: "All that is very well, but we must cultivate our garden."

What is it to cultivate our garden? It is to strive to retain the beauty of our physical environment, to protect and to improve this world we live in; it is also to work with others to the

vented from doing so by a grower who is ill advised, or who unknowingly handled the growing procedures for his crop improperly

If we are to expect the greatest efficiency from our crops, that is, the greatest yield for the fewest dollars spent, every effort must be made to have all cultural factors in careful adjustment and balance.

end that their life as well as ours may be enriched, that their burden of griefs and sufferings may be lightened, and that we may take at least a step toward a better order in our community, our state, our nation, and the world in the hope that future generations may conquer some of the physical and moral scourges which plague us today; it is, finally, to cultivate that inner garden of our mind and spirit so that we may grow, until the end of life, in knowledge, in understanding, and in the appreciation of beauty.

To Cultivate the Best

To cultivate our garden is, then, to preserve and to embellish our physical environment — and preservation is by far the more urgent task. Our ancestors came into an America of such rich natural resources that they could fell forests, drain ponds, break the sod of the prairies, reduce mountains to slag heaps, and fill the air with the fumes of smelters and the smoke of factory chimneys, with little or no thought of ultimate consequences.

This is no longer true today, as we all recognize. Undoubtedly some of you in this room have contributed to the production in Arizona of the world's finest long-staple cotton. Those persons, I am sure, are among the first to recognize that we cannot continue year after year to sink wells deeper and deeper in order to irrigate the cotton fields where nature in her wisdom recognized that the readily available water supply could take care of only such plants as prickly pear and bur sage that had learned to adapt themselves to the peculiar rigors of an arid climate.

We cannot long continue to mine water reserves deposited in deep beds of sand and gravel geologic ages ago, and which therefore cannot be replaced. Such cities as Tucson will go the way of some of the great Roman cities of North Africa when a very slight change in climate diminished their water supply and reduced them

(Continued on Next Page)

PRICE SUPPORTS are a favorite topic of politicians, especially during election campaigns, when the "con" exceeds the "pro." Many Americans, therefore, have the opinion government subsidies are an "evil" existing only in this nation. The truth, of course, is that price supports in one form or another are relatively common throughout the Free World. In France for example, the government subsidizes most wineries, up to 85% of their output.