

the coast. The flood in the Neuse reached 0.2 foot above the high-water mark at Smithfield on the 4th, but was a foot under the high record at Neuse, N. C., and was reported about 18 inches below the high mark in the lower portion at Kinston. The rainfall was the heaviest in the middle watershed, the amount at Raleigh being the greatest of record for the length of time. Floods in the Tar and Roanoke were heavy, but not close to record floods.

Warnings were of much value to many interests, especially in the middle and lower portions of the rivers. Damage was not nearly as heavy as during the floods of last year for two reasons: First, the overflow occurred later in the season when crops were practically matured and partly harvested or ready to be harvested; second, less rain occurred in the lower sections, and with clear weather following the rain for a week or more there was ample time to move crops, stock, and other property to places of safety. One instance may be mentioned, for example, where a farmer in Wayne County employed 100 hands and 40 wagons or trucks and harvested his entire crop on 2,000 acres of land in advance of the flood.

The rise in the Cape Fear at Fayetteville from 5 feet at 8 a. m. of October 1 to 46 feet at 8 a. m. of October 2, 41 feet in 24 hours, is a record change for this district. One instance is mentioned here where by quick action one plant saved goods valued at \$10,000. Losses sustained were as follows:

|  |           |
|--|-----------|
| Tangible property                            | \$200,000 |
| Livestock, and matured and prospective crops | 500,000   |
| Suspension of business                       | 100,000   |
| Value of property saved by warnings          | 350,000   |

Other Atlantic and East Gulf drainage floods were moderate, or at worst not particularly serious. A loss of \$30,000, of which \$14,000 was in crops, occurred in the Pedee system of South Carolina (savings through flood warnings, \$257,000); and damage to the extent of \$36,500 was done on the Choctawhatchee River at Geneva, Ala., and Caryville, Fla. (savings through flood warnings, \$3,000).

In the Ohio Valley rainfall was especially heavy over the Monongahela and lower Allegheny Basins; but, owing to the extreme dryness of the ground, and in some measures to the lowness of the streams themselves, the effectiveness of the rain was materially reduced and the floods of little consequence. The total loss was about \$10,000.

No other damage is reported in the Ohio drainage basin except \$5,000 to corn along the Kanawha River.

| River and station                 | Flood stage | Above flood stages—dates |         | Crest |       |
|-----------------------------------|-------------|--------------------------|---------|-------|-------|
|                                   |             | From—                    | To—     | Stage | Date  |
| ATLANTIC DRAINAGE—continued       |             |                          |         |       |       |
| Santee:                           | Feet        |                          |         | Feet  |       |
| Rimini, S. C.                     | 1           | 2                        | (1) (2) | 31.8  | 6     |
| Ferguson, S. C.                   | 12          |                          | (3)     | 21.0  | 7     |
| Jamestown, S. C.                  | 12          | 7                        |         | 29.1  | 11-12 |
| Catawba:                          |             |                          |         |       |       |
| Mount Holly, N. C.                | 15          | 2                        | 3       | 19.0  | 3     |
| Catawba, S. C.                    | 12          | 2                        | 4       | 28.7  | 3     |
| Wateree:                          |             |                          |         |       |       |
| Camden, S. C.                     | 24          | 2                        | 5       | 36.0  | 3     |
| Malta, S. C.                      | 14          | 4                        | 7       | 18.0  | 6     |
| Congaree: Columbia, S. C.         | 15          | 2                        | 6       | 33.1  | 3     |
| Broad: Blairs, S. C.              | 15          | 1                        | 5       | 39.5  | 3     |
| Saluda:                           |             |                          |         |       |       |
| Pelzer, S. C.                     | 7           | 1                        | 4       | 11.6  | 2     |
|                                   |             | 22                       | 23      | 8.6   | 22    |
|                                   |             | (1)                      | 6       | 30.7  | 2     |
| Chappells, S. C.                  | 14          | 23                       | 24      | 17.9  | 24    |
| Savannah:                         |             |                          |         |       |       |
| Calhoun Falls, S. C.              | 6           | 1                        | 3       | 10.1  | 2     |
| Augusta, Ga.                      | 32          | 1                        | 4       | 45.1  | 2-3   |
| Broad: Carlton, Ga.               | 11          | 1                        | 3       | 27.0  | 2     |
| Altamaha:                         |             |                          |         |       |       |
| Charlotte, Ga.                    | 15          | (1)                      | 17      | 25.2  | 9-10  |
| Doortown, Ga.                     | 10          | 2                        | 15      | 11.2  | 12-13 |
| Everett City, Ga.                 | 10          | (1)                      | 23      | 15.1  | 14    |
| Oconee:                           |             |                          |         |       |       |
| Milledgeville, Ga.                | 22          | 1                        | 5       | 37.0  | 2     |
| Dublin, Ga.                       | 22          | 3                        | 9       | 27.6  | 5     |
| Ocmulgee:                         |             |                          |         |       |       |
| Macon, Ga.                        | 18          | 1                        | 4       | 25.1  | 3     |
| Hawkinsville, Ga.                 | 25          | 4                        | 8       | 30.6  | 6     |
| Abbeville, Ga.                    | 11          | 2                        | 13      | 17.4  | 8     |
| Lumber City, Ga.                  | 15          | 4                        | 14      | 20.0  | 10-11 |
| EAST GULF DRAINAGE                |             |                          |         |       |       |
| Apalachicola:                     |             |                          |         |       |       |
| River Junction, Fla.              | 20          | 4                        | 6       | 21.4  | 5     |
| Blountstown, Fla.                 | 20          | 4                        | 9       | 21.9  | 6     |
| Flint:                            |             |                          |         |       |       |
| Montezuma, Ga.                    | 20          | 4                        | 5       | 20.3  | 4     |
| Albany, Ga.                       | 20          | 3                        | 10      | 25.3  | 5     |
| Chattahoochee:                    |             |                          |         |       |       |
| Eufaula, Ala.                     | 40          | 2                        | 3       | 47.0  | 2     |
| Alaga, Ala.                       | 30          | 2                        | 4       | 39.1  | 3     |
| Choctawhatchee:                   |             |                          |         |       |       |
| Geneva, Ala.                      | 23          | 2                        | 5       | 26.9  | 3     |
| Caryville, Fla.                   | 12          | 2                        | 9       | 14.9  | 4     |
| MISSISSIPPI DRAINAGE              |             |                          |         |       |       |
| Tygart: Phillippi, W. Va.         | 20          | 3                        | 3       | 22.0  | 3     |
| Monongahela:                      |             |                          |         |       |       |
| Lock No. 15, Hault, W. Va.        | 22          | 3                        | 3       | 25.0  | 3     |
| Lock No. 7, Greensboro, Pa.       | 30          | 3                        | 3       | 36.5  | 3     |
| Lock No. 4, Pennsylvania.         | 31          | 3                        | 4       | 35.4  | 3     |
| McKeesport, Pa.                   | 16          | 3                        | 3       | 16.2  | 3     |
| Little Kanawha: Glenville, W. Va. | 23          | 3                        | 3       | 23.9  | 3     |
| New:                              |             |                          |         |       |       |
| Ivanhoe, Va.                      | 15          | 2                        | 2       | 20.0  | 2     |
| Radford, Va.                      | 14          | 2                        | 2       | 18.5  | 2     |
| Glenlyn, Va.                      | 11          | 3                        | 3       | 14.8  | 3     |
| Elk: Clay, W. Va.                 | 18          | 3                        | 3       | 23.0  | 3     |
| Scioto: Larue, Ohio.              | 11          | 23                       | 24      | 11.4  | 24    |
| French Broad: Asheville, N. C.    | 4           | 1                        | 3       | 6.0   | 2     |
|                                   |             | 22                       | 22      | 4.8   | 22    |
| Big Pigeon: Newport, Tenn.        | 6           | 2                        | 2       | 7.6   | 2     |
| Nolichucky: Embreeville, Tenn.    | 10          | 22                       | 22      | 10.6  | 22    |

1 Continued from last month. 2 Continued at end of month. 3 Estimated.

THE EFFECT OF WEATHER ON CROPS AND FARMING OPERATIONS, OCTOBER, 1929

By J. B. KINCER

General summary.—The first decade was generally favorable for seasonal farm work, although there was some delay by heavy rains in the Atlantic States and a few interior sections. In parts of the central and south-western winter-wheat belt rain was needed, but the soil was in rather favorable condition over much of the country. There was no material frost damage and, while late fall crops matured rather slowly due to cool weather, fair progress was made.

During the second decade dry, sunny weather in the Southeast made favorable conditions for crops and field work, while generous rains in some of the dry sections of the winter-wheat belt were very beneficial, although more moisture was needed locally in the Lake region.

| River and station             | Flood stage | Above flood stages—dates |     | Crest |      |
|-------------------------------|-------------|--------------------------|-----|-------|------|
|                               |             | From—                    | To— | Stage | Date |
| ATLANTIC DRAINAGE             |             |                          |     |       |      |
|                               | Feet        |                          |     | Feet  |      |
| Schuylkill: Reading, Pa.      | 10          | 2                        | 2   | 10.0  | 2    |
| James: Columbia, Va.          | 13          | 3                        | 3   | 18.0  | 3    |
| Roanoke:                      |             |                          |     |       |      |
| Randolph, Va.                 | 21          | 3                        |     | 28.8  | 4    |
| Weldon, N. C.                 | 30          | 2                        | 8   | 45.6  | 6    |
| Dan:                          |             |                          |     |       |      |
| Danville, Va.                 | 8           | 2                        | 4   | 11.6  | 3    |
| Clarksville, Va.              | 12          | 3                        | 5   | 15.1  | 5    |
| Tar:                          |             |                          |     |       |      |
| Rocky Mount, N. C.            | 9           | 1                        | 7   | 13.0  | 3    |
|                               |             | 22                       | 26  | 13.4  | 23   |
|                               |             | 3                        | 11  | 26.6  | 7    |
| Tarboro, N. C.                | 18          | 24                       | 30  | 25.5  | 27   |
|                               |             | 4                        | 12  | 19.7  | 8-9  |
| Greenville, N. C.             | 14          | 25                       | 31  | 18.8  | 29   |
|                               |             | 3                        | 5   | 16.3  | 4    |
| Fishing Creek: Enfield, N. C. | 15          | 23                       | 25  | 16.2  | 24   |
| Neuse:                        |             |                          |     |       |      |
| Neuse, N. C.                  | 15          | 1                        | 8   | 23.7  | 4    |
|                               |             | 22                       | 22  | 16.0  | 22   |
| Smithfield, N. C.             | 14          | 1                        | 10  | 26.5  | 3    |
|                               |             | 22                       | 24  | 18.5  | 23   |
| Cape Fear:                    |             |                          |     |       |      |
| Fayetteville, N. C.           | 35          | 2                        | 7   | 64.1  | 4    |
| Elizabethtown, N. C.          | 22          | 2                        | 10  | 38.9  | 6    |
| Haw: Moncure, N. C.           | 22          | 1                        | 4   | 33.0  | 2    |
| Pedee:                        |             |                          |     |       |      |
| Cheraw, S. C.                 | 27          | 2                        | 6   | 39.8  | 4    |
| Mars Bluff, S. C.             | 17          | 3                        | 14  | 27.3  | 7    |
| Poston, S. C.                 | 18          | 6                        | 17  | 26.5  | 10   |
| Lynchess: Effingham, S. C.    | 14          | 6                        | 10  | 19.4  | 7    |

The Pacific Northwest continued very dry. There was some heavy frost reported in middle Atlantic sections, but no material harm occurred.

In contrast to the preceding weather, that during the last decade brought rather general frost over much of the interior of the country, with light deposits in exposed places as far south as the northern portions of Louisiana and Florida. Tender vegetation was frosted and some cotton tops were nipped in parts of the western belt, but crops were so far advanced that there was only slight injury. It was also less favorable for field work in much of the interior, but in the Southwest and middle Gulf sections rainfall was beneficial; drought was still unrelieved at the close of the month in the interior of the Pacific Northwest.

*Small grains.*—During the first decade early-sown winter wheat did well in the Southwest, but it was too dry for much plowing or planting. Seeding was well advanced in most of the Great Plains, but the soil had just become moist enough for this work in Missouri. In parts of the Ohio Valley it was too dry for planting, but in other areas this work was well along, with the early crop up to good stands locally. The weather favored plowing and planting in the northern Great Plains and the Northwest, but the interior of the Pacific Northwest continued very dry, with moisture needed to condition the soil. During the second decade there were beneficial rains in the southwestern belt, extending into Missouri, but parts of this area were still dry; elsewhere conditions were favorable for the winter-wheat crop. During the last decade there was a continuation of favorable conditions and the general advance of the crop was good to excellent, with ample soil moisture. The Pacific Northwest continued seriously dry and seeding was delayed, with the early sown uneven and much in need of reseeding.

*Corn.*—The favorable mild, open weather during the month permitted late corn to mature in good shape. In some interior sections, especially in Missouri, extreme southern Iowa, and the southern half of Illinois, much corn had been in precarious condition, because of the possibility of harm from frost, but the bulk matured satisfactorily and at the close of the month the crop was practically all safe. There was some delay to husking

and picking by rain, but this work, in general, advanced rapidly, with unusually favorable weather for the use of husking machines in Iowa during the last decade.

*Cotton.*—During the first decade there was some interruption by rain to cotton picking and ginning in Arkansas, but generally good progress was made in this work. Bolls opened fast in Oklahoma, while in western Texas the warm weather favored maturity of late bolls. In central parts of the belt there was fair advance made in gathering the crop, but in eastern sections excessive rainfall, with consequent flooding of bottom lands, was decidedly unfavorable and there were many reports of rotting bolls and damaged staple. There were heavy rains in the northwestern belt during the second decade, with interruption to picking and some damage, but the latter part was favorable and gathering continued, although largely completed in Texas, except in the west and northwest. Fair weather in the southeast favored drying, but in the northeastern belt there were some further heavy rains. During the last decade there was some injury to cotton tops by frost in the western belt, with growth generally stopped in the northwest, but no widespread damage, and the frost promoted rapid opening of bolls. In Oklahoma picking was further advanced than in an average year and this work was completed in much of Arkansas.

*Miscellaneous crops.*—Pastures and meadows were in fair to good condition in most sections east of the Rocky Mountains and ranges were good and affording some feed in the northern Great Plains. Rain or snow was beneficial in the Northwest, while generally good condition was reported from the Southwest. The unfavorably dry conditions in the far western States caused a shortage of range feed and stock water. Livestock were largely on winter ranges at the close of the month.

Potato digging was mostly completed at the close of the month and, while there was some injury to truck reported, condition of this crop was good, although growth was confined mainly to the winter producing areas. Sugar beet digging was largely favored, as were cane grinding and cutting. Citrus continued in generally satisfactory condition.

## WEATHER OF THE ATLANTIC AND PACIFIC OCEANS

551.506 (261.1)

NORTH ATLANTIC OCEAN

By F. A. YOUNG

Judging from the number of days in which gales were reported, the weather during the month would not be considered severe over the ocean as a whole, except in the vicinity of the coast of southern Europe where the number of gales was somewhat above the normal. There were, however, a number of unusual features that will be referred to later. These include the anticyclonic gales on the 11th, the severe disturbance in southern waters on the 21st and 22d, and the disturbances of tropical origin in the first and last decades of the month.

Fog was reported on from 10 to 13 days over the Grand Banks; on from 4 to 6 days along the American coast, and on from 1 to 6 days over the steamer lanes, while the coast of Europe was comparatively clear.

Charts VIII and IX show the conditions on the 1st and 2d, respectively, and used in connection with Charts VIII to XV for September give an idea of the track and extent of the tropical disturbance that was first reported on September 22, while Chart VIII for that month gives its position on the 23d. On October 3 the center of this

disturbance was near Albany, N. Y., and on the 4th near Father Point, Quebec, where a barometric reading of 29.32 inches was reported. At Belle Isle on that date, the morning observation gave the wind as east, force 9, barometer 29.52 inches. Vessels between the fortieth parallel and Newfoundland encountered southerly to southwesterly winds of force 5 to 8. By the 5th this low had apparently begun to fill in, the barometer at Belle Isle on that day reading 29.66 inches, while moderate westerly gales continued between the fortieth and forty-fifth parallels, west of the sixtieth meridian.

On the 5th a depression was over Ireland, afterwards developing into a severe disturbance, and from that date until the 8th moderate to strong gales were prevalent over the eastern section of the steamer lanes, the storm area on the 7th extending as far west as the thirty-fifth meridian.

On the 10th and 11th very unusual conditions existed over the western section of the ocean. There was a pronounced high over the eastern United States, with crest near New York City, and practically normal pressure over the Caribbean Sea. The 8 a. m. barometer reading