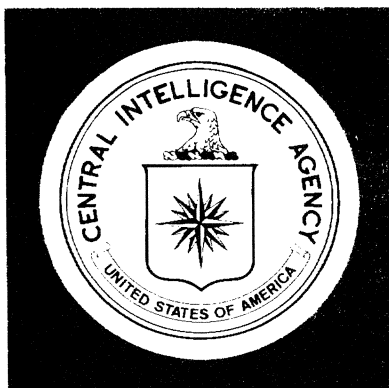


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*USSR: Early August Prospects  
for Grain Production*

**Secret**  
GC AB 77-004  
10 August 1977

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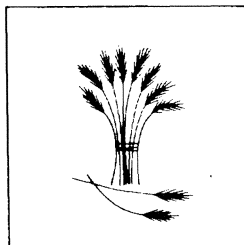
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## Environment and Resource Analysis Brief

# USSR: Early August Prospects for Grain Production

### FORWARD

This is the fourth in a series of 1977 Analysis Briefs reporting current crop conditions and estimating grain production in the USSR. Additional briefs are scheduled for September and October.

Briefs are produced by the Environment and Resource Analysis Center (ERAC) of the Office of Geographic and Cartographic Research and are coordinated with the Office of Economic Research. Weather support is provided by the USAF Environmental Technical Applications Center. In addition, formal and informal consultation/exchange sessions are held with the Foreign Agricultural Service and the Economic Research Service, U.S. Department of Agriculture.

### METHODOLOGY

ERAC derives its production estimates from crop models which are used to aggregate and compare both current and historical data. All intelligence data sources, including satellite imagery systems and meteorological data as well traditional sources—human intelligence reporting, translations, and the open literature—are used in the analysis and estimate of current crop conditions.

Data are analyzed by a multidisciplinary team that includes imagery analysts, agronomists, geographers, meteorologists, economists, and computer specialists.

### KEY JUDGMENTS

- We now estimate that total 1977 Soviet grain production will be 220 to 225 million tons, slightly below our early July forecast. The reduction reflects marginal deterioration in prospects for spring grains east of the Urals.
- Our projection depends on late-afternoon thunderstorms continuing to provide sufficient rainfall for grains in the southern Urals and northern Kazakhstan. As of early August, only one-fourth of the spring grain area east of the Urals had been cut.
- We expect wheat production will be at near record levels and will account for nearly half of the harvested grain.
- Wet conditions in European USSR are complicating this year's harvest but, so far, have not delayed its pace.

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**TOTAL GRAIN PRODUCTION**

Based on crop conditions as of early August and projected weather patterns through harvesting, we continue to estimate a bumper Soviet grain harvest, about 220 to 225 million tons (see Table 1). The high end of our new forecast is the same as our early July estimate of 225 million tons, but we now believe there is a good possibility that the final harvest may be a few million tons less. The adjustment in our estimate reflects marginally lower soil moisture levels in parts of the spring grain area east of the Urals (see Map 1).

Although we project the size of the 1977 Soviet grain crop to approach last year's output, its composition is significantly different. Total winter grain production should reach 72 million tons, compared with 61 million tons in 1976. This year, an exceptionally large winter wheat crop will probably offset lower production of spring wheat and spring barley. We project total spring grain production, including pulses, to range from 148 to 153 million tons, at least 10 million tons less than in 1976. The primary swing factor in our spring grain estimate is projected outturn in Kazakhstan. We expect grain production in Kazakhstan to reach 22 to 26 million tons. If soil moisture levels in Kazakhstan remain adequate throughout August, then the larger output should prevail.

We estimate total wheat production at 105 to 107 million tons—near the 1973 record of 110 million tons. The bottom of this range currently appears likely because of sizable pockets of low soil moisture in the southern Urals and western Kazakhstan. Feedgrain production should reach 102 to 105 million tons.

**CROP STATUS**

Across most of the Soviet grain belt, less than average winterkill in the fall-seeded grain and better than normal spring seeding conditions have resulted in one of the largest grain areas ever. The Central Statistical Administration (CSA) in Moscow has reported that the area sown to grain in 1976-77 was expanded to 131.4 million hectares. Assuming normal abandonment of 2 to 2½ million hectares, the harvested area should reach 129 million hectares, the largest area since 1964.

**Winter Grains**

Much of the overall success of the 1977 total grain crop rests firmly on the unusually large production of winter grains. In contrast to the previous year—when winter losses were more than a quarter of the crop—this year's winter grains sustained only moderate damage. As a result, the winter wheat harvest will encompass about 22 million hectares. In the Ukraine, the harvested acreage will probably exceed that region's previous record by at least 15 percent.

Confirmation of this excellent winter grain crop is provided by imagery (see Images A and B) and ground observations by US exchange teams. Soviet press reports from the Ukraine, Moldavia, and parts of the North Caucasus tout record and near-record yields. Three Ukrainian oblasts—adjacent to the Black Sea—already have substantially boosted planned sales to the state.\*

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\* This is consistent with our last publication which projected yields 10 percent greater than previous maximums in these areas. USSR: Current Status of the 1977 Grain Crop. GC AB 77-003, 8 July 1977.

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TABLE 1  
USSR: Grain Production <sup>1</sup>

	Million tons						
	1971	1972	1973	1974	1975	1976	Estimate 1977
TOTAL .....	181.2	168.2	222.5	195.6	140.1	223.8	220-225
Winter Grains .....	63.0	40.6	63.5	62.5	48.6	60.9	72
Wheat .....	47.8	29.4	49.4	44.7	36.6	44.6	57
Rye .....	12.8	9.6	10.8	15.2	9.0	14.0	13
Spring Grains .....	118.2	127.6	159.0	133.1	91.2	162.9	148-153
Barley .....	32.3	35.1	51.7	51.6	32.8	67.1	59-60
Wheat .....	51.1	56.6	60.5	39.2	29.5	52.3	48-50
Other .....	34.7	35.6	46.7	41.9	28.7	43.1	41-43

<sup>1</sup> Because of rounding, components may not add to totals shown.

### Spring Grains

Localized showers produced an irregular pattern of crop development in the major spring grain region east of the Urals. In June, lack of adequate rainfall reduced soil moisture levels in an area that extended from the southern Urals to northern Kazakhstan (see Map 2 and Images C and D). Beginning in July, broad frontal systems have swept moderate rain storms across the Urals and into the Siberian spring wheat areas.

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As a result of the increase in precipitation, the area of moisture deficiency has been noticeably reduced. In addition, imagery confirms that many small, scattered areas of improved crop vigor now dot the zone of moisture deficiency (see Image E). We expect this weather pattern to continue through late August; however, these new storm systems may produce somewhat less rainfall than the amounts which fell in July.

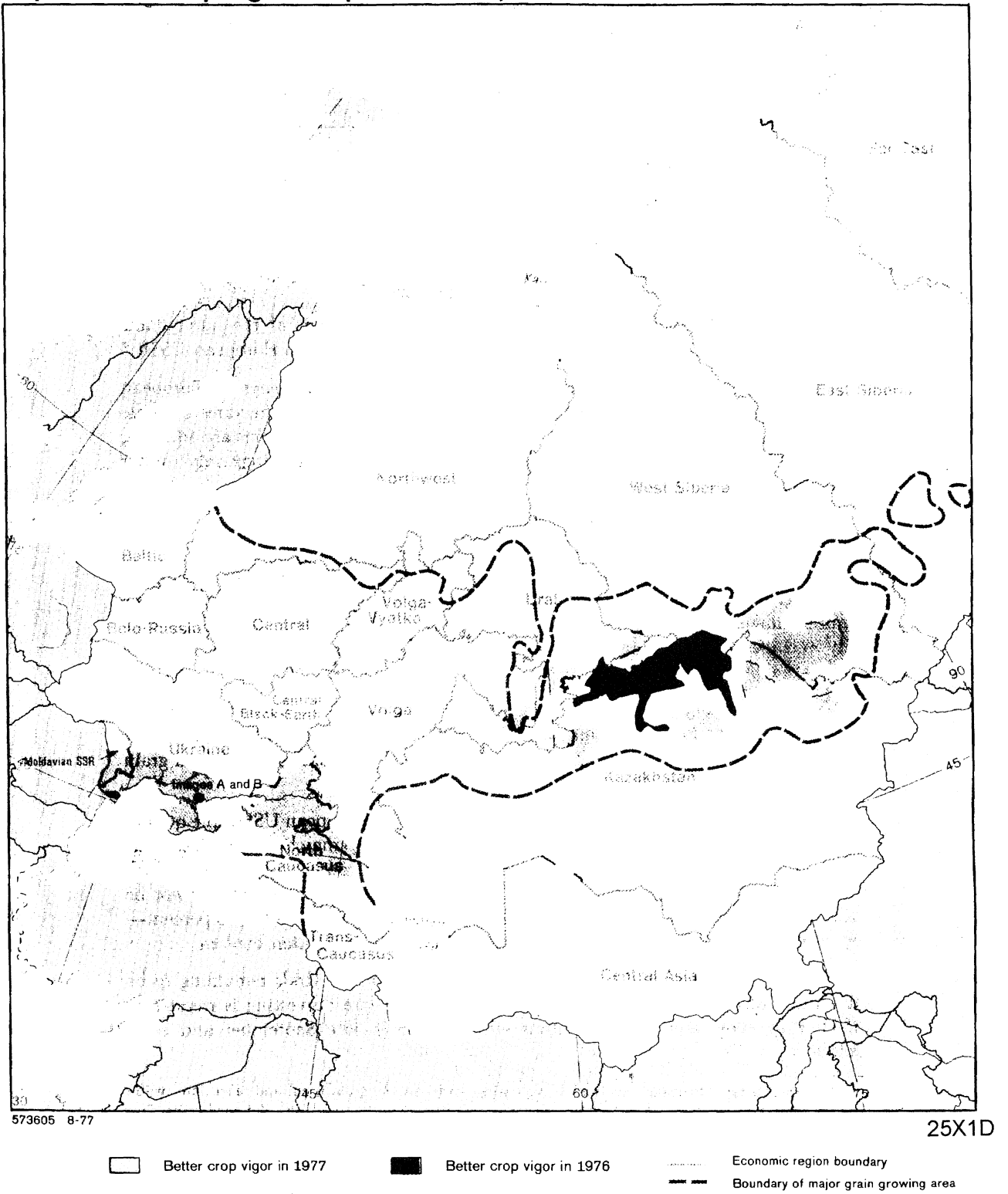
In European USSR prospects continue for above average spring grain yields since moderate temperatures and above normal precipitation have prevailed since early spring. Barley—the major spring grain crop in European Russia—will tally less this year because of the increase in winter wheat seeding. Barley is normally sown to replace fall-seeded grains that do not survive the winter.

### Harvest Progress

Despite unusually wet conditions in Moldavia, the eastern Ukraine, and parts of the North Caucasus, the progress of the 1977 grain harvest is ahead of the 5-year average and substantially faster than in 1976. According to the Soviet Central Statistical Administration by August 1 grain and pulse crops, excluding corn, were cut on 44.5 million hectares—slightly more than one-third of this year's crop area. In addition, the Soviets reported that about four-fifths of the cut grain had been threshed (see Table 2), a considerable improvement compared with earlier progress

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Map 1. USSR: Crop Vigor Comparison 1976, 1977



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TABLE 2

USSR: Harvest Progress <sup>1 2</sup>

	Million hectares				
	1973	1974	1975	1976	1977
Actual Harvested Area	126.7	127.2	127.9	127.7	129 <sup>3</sup>
Area Cut as of 1 August .....	26	18	46	18	36
Percent Cut.....	21	14	36	14	28

<sup>1</sup> Cut and threshed, excluding corn.

<sup>2</sup> Components and percentages are rounded

<sup>3</sup> Accounts for normal abandonment of 2-2½ million hectares

reports. In mid-July, threshing delays had reached 50 percent of the harvest and caused officials to express concern about grain quality in southern European USSR.\*

Initially, Soviet officials had expected significant harvest delays in European USSR to result from storm-flattened crops—more than 20 million hectares by some press accounts. [redacted] farmers are adapting well to this year's complicated conditions and are experiencing only minor problems.\*\*

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OUTLOOK

If growing and harvesting conditions do not significantly deteriorate during the remainder of this crop season, the 1977 Soviet grain harvest is likely to remain in the bumper range. Attaining this level of production will require that harvest losses be only average and that current favorable weather conditions—especially east of the Urals—prevail.

Since early August, however, heavy rains have delayed the harvest in northern Belorussia and the Baltics. So long as the excessive rainfall is limited to this area, the impact on total grain output will be minor. The affected regions' share of total grain production averages roughly 5 percent.

Due to unusually wet harvest conditions in southern European USSR, the quality of at least a portion of the early harvested winter wheat crop may be jeopardized. The rapid harvest of winter wheat and the high moisture content of the grain will probably overtax drying capacity. Chances are that some of this wheat will not be suitable for milling or breadmaking. Excess moisture—greater than 14 to 15 percent—results in spoilage of stored grain and a deterioration of the gluten content.

With about three-fourths of the spring grain east of the Urals remaining to be cut, final output is far from certain. In West Siberia, late harvesting is frequently affected by snow and frost conditions which occur in late September and early October.

\* In most areas a two-stages method of harvesting—whereby the grain is cut and raked into swaths and then threshed at a later date—is being used to reduce the losses associated with flattened crops. Two stage harvesting is slower than direct combining but generally preferable for lodged grains.

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Note: This paper was produced by the Office of Geographic and Cartographic Research and coordinated with the Office of Economic Research. Comments and questions may be directed to [redacted] Code 143, Extension 3748. Date of information 8 August 1977.

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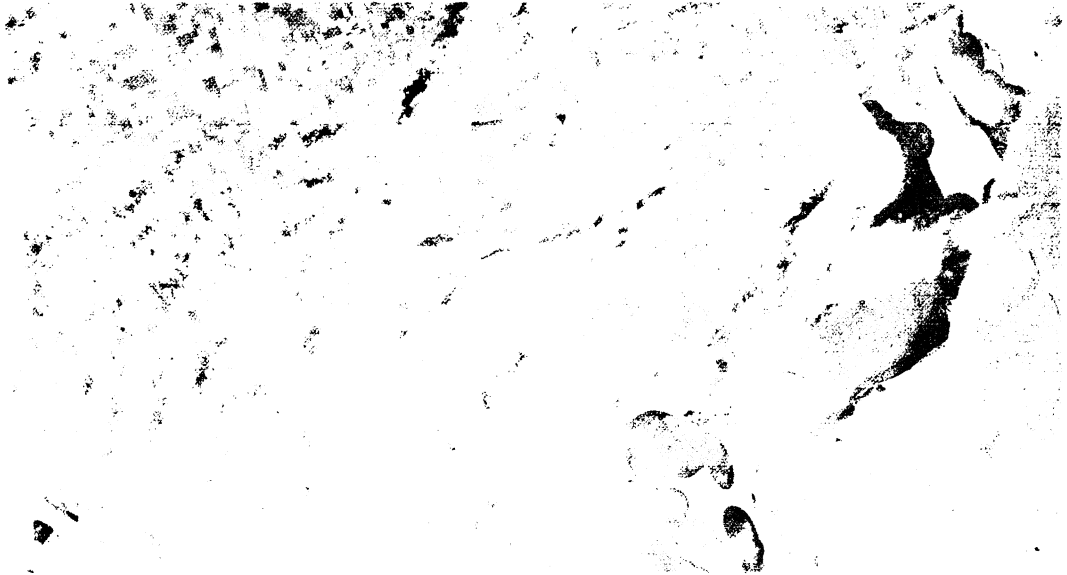
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**Image A.**

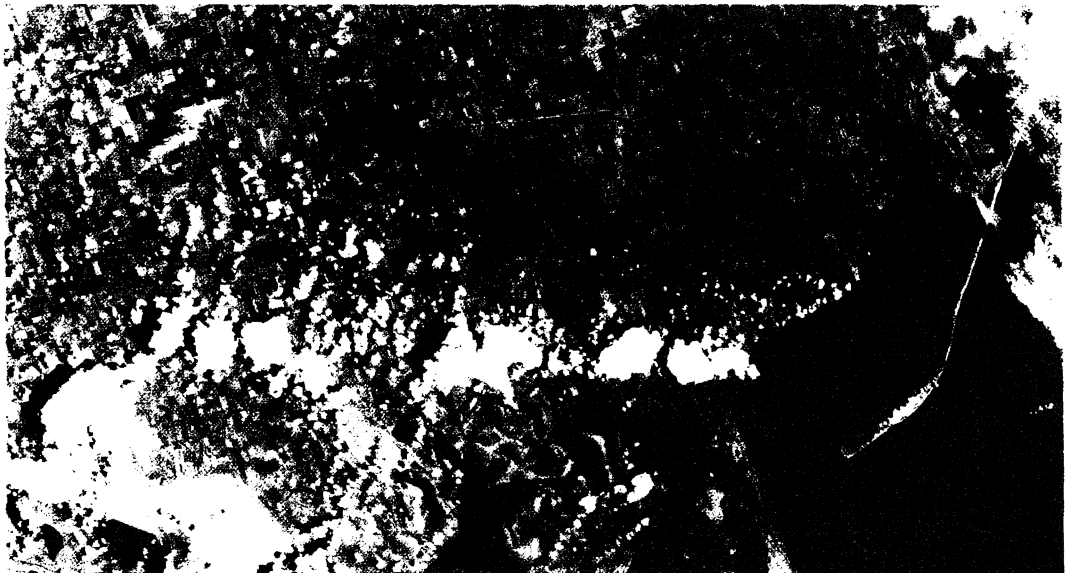
~~Image C.~~ **LANDSAT II Imagery, Summer 1976, Southern Ukraine**



Excellent IR return from the 1977 imagery indicates improved crop vigor levels in this year's winter wheat.

**Image B.**

~~Image D.~~ **LANDSAT II Imagery, Summer 1977, Southern Ukraine**



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**Image C.**

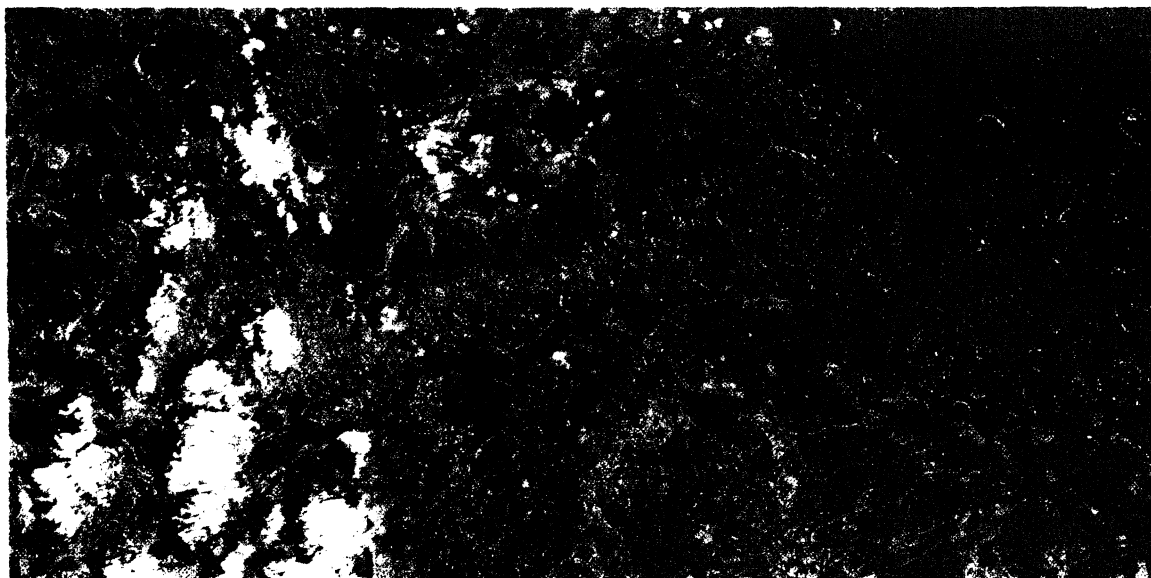
~~Image A.~~ **LANDSAT II Imagery, July 1976, Northern Kazakhstan**



Imagery depicts the same spring wheat region at milky-ripe stage of development – when the kernels form in the grain head. Good IR return on 1976 imagery denotes substantially better crop conditions last year.

**Image D.**

~~Image B.~~ **LANDSAT II Imagery, July 1977, Northern Kazakhstan**



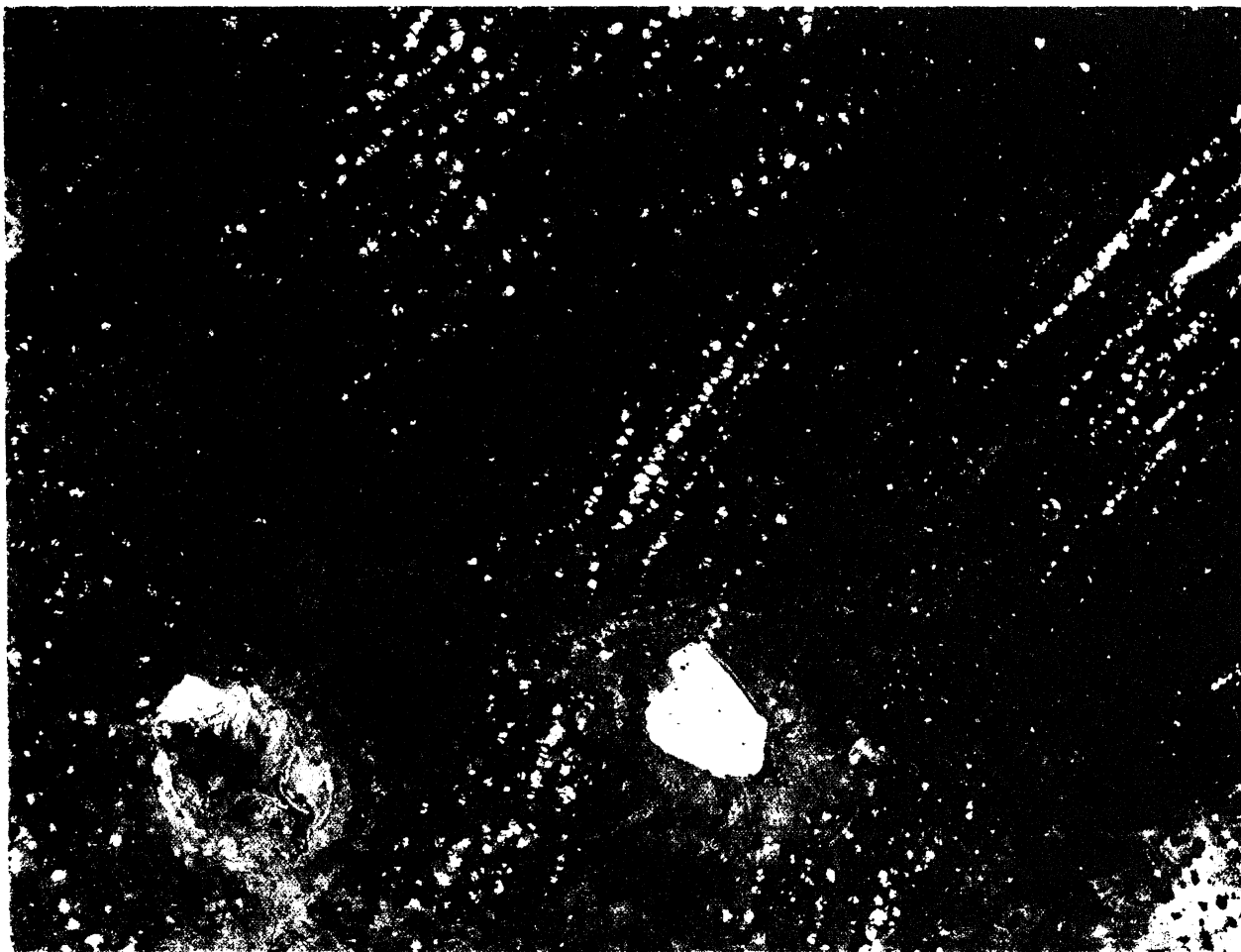
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**Image E. LANDSAT II Imagery, July 1977, West Siberia**



Imagery depicts localized rainfall pattern in spring wheat region. Red IR return indicates good crop vigor from recent shower activity.

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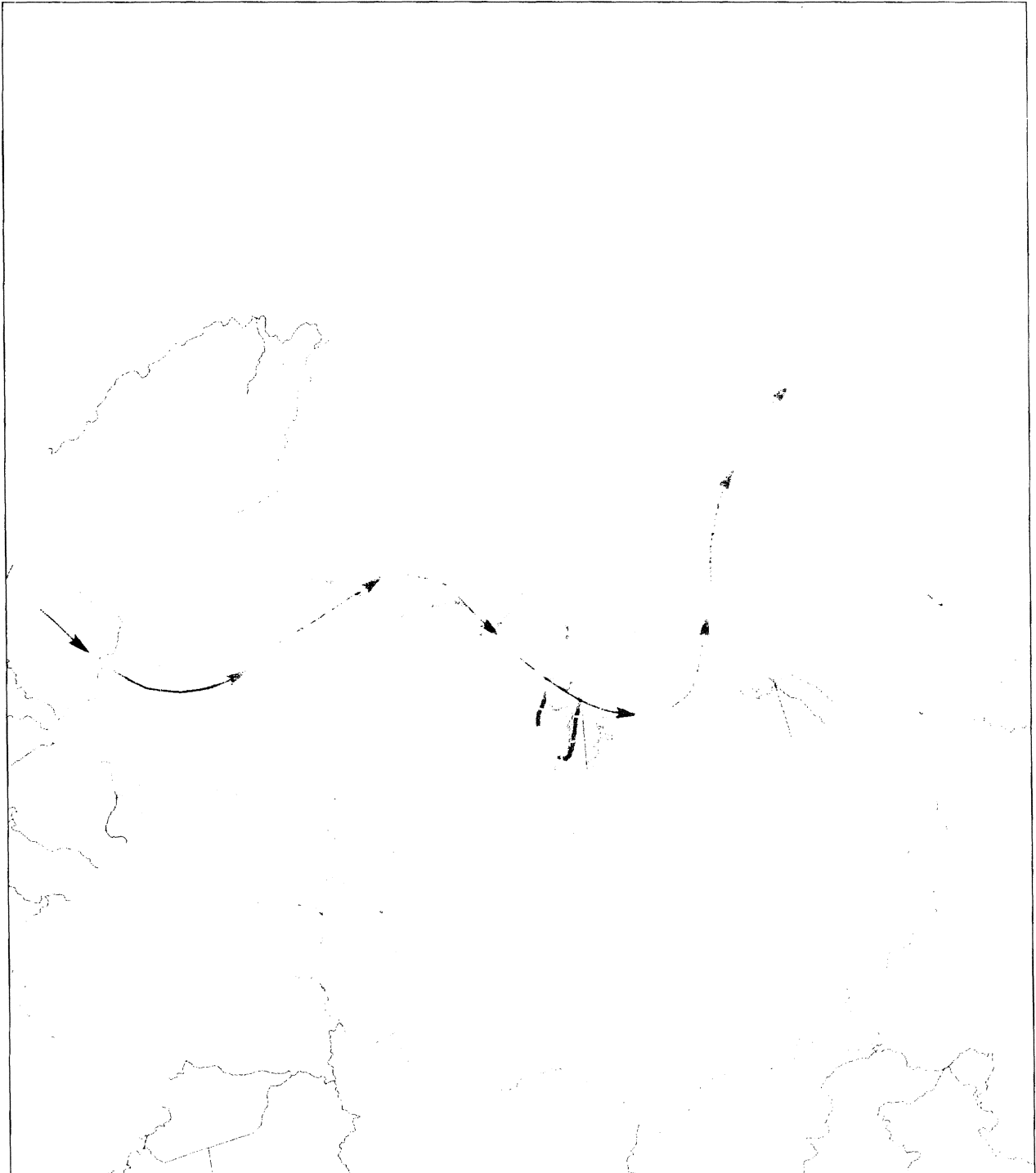
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




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Map 2. USSR: Meteorological Composite Depicting Soil Moisture as of 20 July 1977



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- |   |   |   |  |   |                                      |
|---|---|---|--|---|--------------------------------------|
|  | Zone of excess moisture (>20% deviation from cumulative norm) |  | Zone of moisture deficit (>20% deviation from cumulative norm) |  | Mean July storm track                |
|   |   |   |  |  | Economic region boundary             |
|   |   |   |  |  | Boundary of major grain growing area |

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