PHYSIOGRAPHIC BACKGROUND

This chapter presents physical, ecological and other features of the area under study which reflects the suitability of all existing situation for cultivation of Lemon grass.

[II.1] Location & Site of Ballia District:

The district of Ballia is situated between 25°-35’ to 26°-12’ of Northern latitudes and 83°-12-84°-40’ of the Eastern longitude in the Eastern most corner of the state of Uttar Pradesh (Fig.-1) According to the District Statistics Patricia, the district had an area of 3168 sq. km. on June 2000, and occupied the 51st position in the State in respect of area. It exists in middle Gangetic plains region of Agroclimatic region of India. It is really an aggregation of rural villages.

It comprises of an irregularly shaped tract of land extending westward from the confluence of Ganges and Ghaghara. The former river bounds it on the south, separating Ballia from Bihar, while the latter flows along the Northern and Eastern borders, separating it from the district of Deoria and from Bihar. On the West the boundary is for the most part artificial, the most important exception being the Sarju river for several kilometers of it course. To the West-North it borders with Mau and to the South with Ghazipur. The river Ganges is aided and
abetted in its course changing by the Ghaghara whose confluence forms the triangle known as *Doaba*. The fertility status of the soil of the district is generally poor, low in organic matter and available N, low to medium in P and medium in K. The status of available Zn ranged between 0.02 to 1.82 ppm in the district (Agarwal *et.al.* 1970)

The district comprises of six tehsils i.e. Ballia, Rasara, Bansdih, Bairia, Sikandarpur and Belthra Road and seventeen blocks. Ballia city is situated on the left bank of the Ganges below the confluence of the lesser Sarju.

**[II.2] Population:**

According to the census of 1991, the district occupied the 26th position in the State in respect of population which was 2262273 of which 1099966 were females. The rural areas were inhabited by 2038186 persons, 993550 being females and the urban by 224087 (females being 106416) and total SC population is 332220 in the District. At the 2001 Indian census, Ballia had a population of 102,226. Males constituted 54% of the population and females 46%. It had an average literacy rate of 65%, higher than the national average of 59.5%, with 58% of the males and 42% of females literate. Eleven percent of the population was under six years of age. As per provisional data of 2011 census, Ballia urban agglomeration had a population of 3,223,642 out of which males were 1,667,557 and females were 1,556,085. The literacy rate was 86.65 per cent.

**[II.3] TOPOGRAPHY:**

The district is a level plain, intersected by numerous streams. Though there are no hills, the level surface is varied because of the high banks of the great rivers and the gentle slope from the central water shed towards the Ganga, the Ghaghra
and the Saryu. There are depressions of varying depth and extent in which the drainage water collects, prior to its draining into the main systems of the river. The district can be divided into two natural divisions: the interior upland and the lowland tract. In area the two divisions are approximately equal. The upland has an average altitude of 64 m. above sea-level and comprises the western half of the district, including the whole of the Bhadaon. Lakhnesar and Kopachit parganas, most of Sikandarpur, the interior portion of Garha and a narrow strip of land extending eastwards into the Kharid and Ballia parganas. Here the boundary is marked roughly on the south by the railway line as far as Sahatwar and then bends back in a direction generally parallel to that of the Ghaghra, close to the town of Bansdih, from which place it curves westwards and then north to Maniar, a town standing on the bank of the Ghaghra. There is a second ridge of the same nature near Qutabganj but between these two spots the bed widens out into an extensive alluvial tract. In the west of Qutabganj there is another stretch of low alluvial land, continuing as far as Bilthra, where the high bank touches the river. On the south-west the tracts that are higher terminate in the valley of the Saryu, which has a deep channel of no great width. In the interior the level is only broken by scattered depressions. The soil is for the most part a light loam with a fair admixture of sand. The proportion of sand increases on the higher ridges and the soil becomes very light, though not unfertile. In the depressions the soil is mostly clay and in these tracts paddy is the chief crop. The western portion of the upland is characterized by wide stretched of user, which is very common in the Kopachit, Lakhnesar, Bhadaon parganas and part of the Sikandarpur pargana. The lowland tract comprises the rest of the district but is far from being of a uniform character. The main distinction is between the more recent and the ancient alluvium, the former lying near the banks of the river and the latter including those land which have remained untouched for a long time and are marked by great fertility.
The surface of the lowland is usually very uneven, being scored in every direction by irregular depressions marking the old courses of the rivers, some almost resembling tributary streams and others surviving as narrow lagoons. As a rule the level is about 4.5 meters below that of the upland, though it varies from place to place.

[II.4] Location of Experimental area:

The experimental sites are located at Ballia district, the eastern most part of the Uttar Pradesh lies between 25°23" and 26°11" North latitude and 83°38" and 84°39" East longitudes. Total Geographical area of the district is 2981 sq.km (2012). The eastern boundary of the city lies at the junction of the Ganges and the Ghaghara. The district of Ballia is situated between 25°-35 to 26°-12’ of northern latitudes and 83°-12 to 84°-40 of the eastern longitude in the eastern most corner of uttar Pradesh. It exists in middle Gangetic plain region (Zone - IV) of Agro – climatic region of India. Ballia city is situated on the left bank of the ganges below the confluence of lesser Sarju. The fertility status of the soil of the district is generally poor, low in organic matter and available N, low to medium in P and medium in K. The Status of available Zn ranged between 0.02 to 1.82 ppm in the district (Agarwal et.al.1970)

[II.5] Climatic condition and rain fall:

The district Ballia falls under sub humid climate with grassland vegetation, on the basis of climatic classification with PE index of 44.4. The temperature in 2009 was maximum in May with 32.25°C followed by June with 30.75°C. The coldest month in 2010 was December (12.15°C) followed by January (15.9°C). The humidity was maximum in August (82.5%) followed by September (80%).
Annual PET of Ballia district on the basis of Varanasi data was 1608.9 mm. The normal annual rainfall was 983 mm while monsoon rainfall was 864.8 mm.

[II.6] GEOLOGY:

The geology of the district exposes nothing except the ordinary Gangetic alluvium. The mineral products are few being confined to the saline earth from which saltpeter and salt are produced and to the limestone conglomerate known as kankar. Saltpeter is found in the Rasra tahsil, though patches are also found elsewhere. Kankar is found in all parts of the district except in Doaba and the lower tracts of pargana Ballia. At some places it is found in mass on the surface, at others at a considerable depth and at some places it exits as a solid and compact mass but usually it occurs in small nodules. Often it takes the from of black kankar and in this shape it is quarried at Sinhachaur on the road from Phephna to Rasra. It is used for road metal, for concrete and for producing lime.

[II.7] SEISMOLOGY:

Ballia is situated in the area where earthquakes of slight to moderate intensity have been experienced in the past. The earthquakes which have affected the area are the Rewa earthquake of 1927 and the Bihar-Nepal earthquake of 1934, the maximum intensity experienced during the latter being VII of the Modified Marcally (MM;) SCALE (1931). The occurrence of earthquakes in Ballia district is attributed to various geological and tectonic faults such as the great Himalayan boundary fault, the Vindhyan fault and the Patna fault. In the seismic zoning map
of India, Ballia lies in zone III which corresponds to the seismic intensity of VII MM.

[II.8] FLORA:

There are no forests in the district but along the great rivers there are numerous expanses of sandy ground covered with jhau or tamarisk which afford cover to wide pig and other animals. A few patches of dhak (Butea monosperma) are also round in the interior of the district. The other trees which are commonly found in the district are bargad (Ficus bengalensis), mahua (Madhuka indica), neem (Azadirachta indica), pipal (Ficus religosa), bahera (Terminalia bellirica), barhal (Artocarpus lakoocha), bel (Aegle marmelos), gular (Fidcus glomerata), jamua (Syzygiumcummini), aonla (Emblidca officinalis), kathal or jack-fruit (Artocarpus heterophyllus) and shisham (Dalbergia sissoo). The tar or toddy palm is abundant, especially in the western parganas.

[II.9] FAUNA:

Not being endowed with forests, the variety and number of wild animals is limited. The fox (Vulpus bengalensis) and jackal (Canis aurcus) are common. Wide pig (Sus secrofa) is found in the lowlands of the Ganga and Ghaghra and black buck (Antelope carricapra) in the patches of trees found along the banks of the Ganga, particularly in pargana Doaba. The nilgai (blue bull) (Boselaphus tragocamelus) is found in most parts of the district.

[II.10] Birds:

A variety of birds is found in the district. The most common among the game birds is the partridge (Francolines podicerionus) which occurs everywhere and is locally known as titar. Other types of partridge, such as kala titar (or black
titar) are rare. Among the quails the most common are the bater (Coturnix communis) and the lava (Perdicula asiatica) which are usually found in bushes. Other birds found in the district are kabutar or pigeon (Columbia livia), fakhta or dove (Streptopelia decaoctor), pakia or turtle dove (Streptopelia chinesis), harial (Streptopelia senegalensis), peacock (Pavo cristatus), snipe or chaha (Capilla gallinago), lal sir (Netta rufina), white eyed pochard or khanjan (Aythya rufa), nil sir (Anasplaty rhynchos), seekhpar (Anas adcuta) and jal murgi (Amaurornis phoeonicusns).