

many parasitical insects, all of which lead most effectually to destroy the anticipated results of his industry. The condition of perfect humidity in a warm atmosphere, at certain seasons of the year, will suffice to cause his crops to be clothed with the most destructive of microscopic plants. This humid state may occur in March, April, September, &c., without being the cause of prejudicial results, if it happen in May or June great danger is to be apprehended. From observation, we learn, that luxuriant wheat grown on rich moist soils is very liable to be struck with Rust or Mildew. This is often the case on fertile river bottoms—on the rich bottoms of the Thames &c. It is also remarked that in late seasons Rust is most destructive; that the time when it strikes the plant is generally in the month of June—if late in that month, the straw only suffers, if early, straw and grain are both lost. Now, as the humidity of the atmosphere is beyond the control of man, he must adapt his labours to the circumstances of the climate. He must endeavour to have an early crop—with a thin, strong, flinty stem. It has been before remarked, that the means for ensuring the ripening of wheat, from two to three weeks earlier than the average period, are to be found in draining and liming, both operations, besides ensuring early maturity, improve the sample and strengthen the straw.

The agriculturist is dependent upon other meteorological phenomena, with the due occurrence of which, the health of his crops is most intimately associated; upon rain and temperature. He has occasionally to deplore the occurrence of dry weather in the spring, and of wet weather in the harvest time. The seasons of the present year were particularly distinguished by these drawbacks. Those artifices which are commenced by experience and suggested by the science of agriculture, present him with the only means capable of lessening the amount of evil flowing from such casualties. On drained soils, the roots of cultivated crops descend deep, and find in dry weather a supply of moisture. Their early maturity saves them from that destruction which is always more or less to be lamented in wet harvests. In backward and wet seasons, the grain crops lose many days of warm spring weather on undrained soils, before they commence growing. The heat of the sun must first drive off the superfluous water, which is lodged in every hollow and depression, although it may not be visible at a superficial view. Cold rains invariably check the growth of vegetables, and a cold watery bottom (pan) to the soil in which the roots repose, can never be expected to favor the growth of a healthy plant. The appearance of yellow leaves upon wheat in the spring, is the result of disease, and may be produced by excess of moisture or by excess of drought. It has been already shown, under the head of draining, that that operation greatly increases the temperature of the soil, by allowing warm air to circulate through its pores. Vegetables do not necessarily thrive when the surface of the soil is exposed to a great increase of temperature; it is when heat descends to the

roots that they feel its invigorating influence. The warm sun of April and May cannot produce the same effects in vegetable mould, as upon one of a light, sandy, porous character.

We have seen that uncultivated vegetables derive a very large portion of their substance from the admixtures of air, carbonic acid and ammonia. Cultivated crops obtain these elements of food, not only from air and decaying vegetable matter, but also from manures. That department of husbandry which involves the production, preservation and application of manure, necessarily calls for the careful attention of the agriculturist. Chemistry and experience both set their mark upon farm-yard manure, as constituting the most useful means of improving the fertility of the soil: and of farm-yard manure, the liquid portion, the urine of animals, is unquestionably the most valuable. The solution of mineral ingredients in water, previously to their entrance into the roots and system of vegetables, directs particular observation of the soils, and the properties possessed by their component parts. It appears that the same kind of vegetable growing for a succession of years upon the same soil, abstracts certain soluble mineral ingredients, faster than the great agents, heat, air and moisture, can create a supply from the vast store which exists in an insoluble state in the soil. Hence the vegetable cultivated under such circumstances, becomes deteriorated in quality, and approaches nearer and nearer to that primitive, wild state, in which its kind existed before cultivation produced the wondrous development of its organs which fit it for the food of man. (Witness the wild potato, the plum, wild rice, wild wheat, wild oats, &c.) To avoid this deterioration, experience and agricultural chemistry point to rotation of crops, following under certain circumstances, farm-yard manure, mineral manures, as lime, wood-ashes, gypsum, &c.

The growth of weeds among cultivated crops, is an increasing and serious evil. Nourishment which, in their absence, would find its way into farming produce, feeds them into a luxuriant and fruitful habit, which at once suppresses the growth diminishes the yield, and impairs the sample of those vegetables for whose benefit all the artifices of husbandry are expressly practiced. The use of clean seed, the practice of clean cultivation, of draining, and of rotation of crops, can alone eradicate those hurtful vegetables, which, from past neglect, seem now to be successfully struggling to gain exclusive possession of many fertile tracts of country.

The cold of winter is sometimes so severe, that the wheat plant loses its vitality, even on drained soils. This happens when there is a deficiency of snow. A covering of snow prevents radiation of heat from the earth into the clear expanse above. The temperature of two plants, one exposed to air on a fine clear cold night, the other covered with a very loose coating of straw, differs by many degrees. A few loads of long dung or litter strewed over the wheat in the month of December, will retard radiation, and prevent the temperature of wheat plants from sinking so low