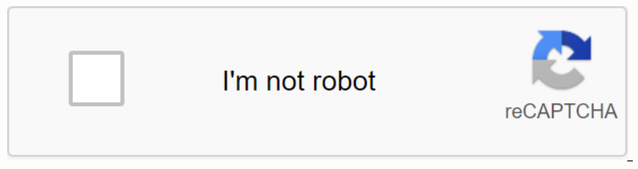

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What is wind erosion pdf

The term wind erosion refers to soil damage due to the removal of soil by wind from the area. Most often, wind erosion occurs on flat soil in dry or sandy areas. For example: Tree next to the cliff as examples of wind erosion Rock formation in various places carved by wind erosionDunes, especially in deserts, of which sand is blownVarious rock or sand structures created by wind blown away rocks and sand around them Effects of wind erosion circumstances, ancient cities can be buried by the movement of wind from one area to anotherInfertile soil is not able to provide nutrients for growing food and plantsDegradation of crops due to food loss and economic loss to farmers Wind erosion can happen anywhere and anytime wind Blows. Wind erosion can occur in any area where the soil or sand is not compacted or has a finely granular nature. Not only does wind erosion damage the soil by de-edating the soil and reducing soil nutrients, but it can also cause air pollution. Surrounding crops, covering highways and invasion houses, sand, dust and dirt created from wind erosion can affect plant and human life in many ways. Wind erosion can result in different types of soil movement. These three types of different types include suspension, doting and salting. The suspension occurs when the wind takes fine particles of dirt and dust into the area and can move said particles over long distances. Creep occurs when soil particles overturn the area and meet particles that have been through salting. Salting is the primary means of soil movement. In this process, soil particles move along the surface, damaging the vegetation and surface of the soil. Wind erosion can cause any of these different types of soil movement, which leads to soil erosion. Another way to consider types of wind erosion is to consider deflation and aeration. Deflation is the process by which the wind moves particles that are free. Aeration is when an area is eroded directly by airborne particles. When the wind moves to lose soil and particles of dirt, this would be an example of deflation. When airborne particles cause the land to wear out or errod, on the other hand, it is an example of aeration. Proper placement of crops that deal appropriately with crop residues, and effective planting can reduce the impact of wind erosion. USDA-agricultural research services and other agencies have created means to protect against wind erosion. Elements contributing to winderohussAZína Increase soil cohesion: using organic matter sprayed on top of the soil or increasing irrigation can help the soil to stay moist and stick together. Increase in soil roughness surface: By creating ridges of suitable size (less than 40 centimeters high), wind erosion can be reduced. Growing vegetation: planting on the ground, wind ability soil removal is significantly reduced. Creating wind breaks: by arranging tree planting around the area, wind erosion can be reduced in two ways. First, trees can reduce the amount of wind capable of reaching the soil. Secondly, the shade reduces evapotranspiration, which means that the soil can retain moisture. Now you have seen a lot of different examples of wind erosion and you can better recognize this phenomenon when it occurs. The Dust Bowl of 1930 left vivid images in our minds of the prairie sky blackened by the blowing of the laying hen. But stronger than the images of blowing the soil was the damage - unproductive fields and destroyed crops. The Dust Bowl crisis has forced prairie agriculture to look for ways to control and prevent wind erosion. Considerable progress has been made since then. Many individuals have devoted countless hours to improving the management of prairie land. Numerous improvements in agricultural machinery, crop varieties, fertilisers, herbicides and other crop inputs have helped farmers reduce wind erosion. Lawmakers acknowledged the importance of preventing wind erosion. The Soil Protection Act empowers any land protection officer to cooperate with landowners, either in cooperation or by issuing a legal notice, to stop or prevent erosion. Wind erosion reduces the soil's ability to produce crops. However, farmland throughout Alberta is still exposed to periods of drought and strong winds. And farmers still have to manage their crop and grazing systems to reduce and prevent soil blowing. This publication describes ways to protect the soil from wind erosion. The effects of wind erosion Wind erosion damaged an estimated 900,000 hectares (2 million acres) of farmland in Alberta during the 1980s. Strong and sustained winds, together with dry, bare soils, have contributed to serious land losses. Wind erosion is the separation, transport and redeposition of soil particles by wind. The most famous result of wind erosion is the loss of topsoal and nutrients, which reduces the soil's ability to produce crops. Loss of topsoal can be perceived as rocky or gravelly hills, thin soils mixed with lighter colored subcursiveness or the presence of calcium carbonate in surface soils. The reintroduction of the upper part can be considered as elevated fence lines, blackened snow drifts, sand deposits and ditches filled with soil. Soil productivity is affected by wind erosion in different ways. Areas of erosion and storage in the area increase differences in soil characteristics and require more costly and less efficient land management practices. The wind removes smaller particles of clay and organic matter from the soil, while coarser materials are left behind. The continued loss of fine particles reduces soil quality. In shallow and hard-layered soils, wind erosion also results in a decrease in the depth of the root zone and water retention capacity. Such changes can occur slowly and go unnoticed for many years, especially if mixing by working obscures the effects of wind erosion. The wind removes soil particles and leaves rocks exposed to the surface. Factors influencing wind erosion Sparse or missing vegetative cover, loose, dry and smooth soil surface, large fields and strong winds increase the risk of wind erosion. Vegetation protects the soil from wind erosion by reducing wind speed on the surface of the soil. Vegetative cover can be a growing crop, standing stubble or other crop residues. Most soil requires 30% of the soil to prevent wind erosion. For grain crop residues, this equates to approximately 900 to 1100 kg/ha (800 to 1000 lbs/ac) of residues. Highly erodable soils could require twice the amount of residues. The soil structure and structure also affect the risk of wind erosion. Clays, clay clays and muddy clays are generally more resistant to aggregation breakdown and are therefore more resistant to wind erosion. The structure of the soil is a combination of individual soil particles into aggregates. Aggregates are heavier than individual particles, making them harder for the wind to move. Organic matter helps hold aggregates together, so soils with more organic matter are more resistant to wind erosion. Sandy soils are very susceptible to erosion. Clay soils, which have been crushed by frequent freezing and thawing, are also very erodable. Wind erosion of crop management and pasture The most common crop production systems in Alberta are: rotation, which include summerfallow; continuous trimming; irrigated crops; and forage. Wind erosion is a threat to soil in all four crop and pasture systems. You can reduce wind erosion and maintain production by maintaining a protective plant cover for the soil. Tilling summerfallow fields dry the surface soil and leave it vulnerable to erosion. Bare fields are particularly threatened by wind erosion in late winter and spring at the end of the fallow period and immediately after sowing another crop. The best way to preserve soil moisture and prevent wind erosion is to leave as many crop residues as possible during the fallow period. Crop residue cover reduces evaporation and standing stubble captures snow for extra moisture in spring soil. At the same time, the remnants of crops reduce the wind speed on the surface of the soil, and standing stubble anchors the soil. To preserve crop residue cover, some farmers choose to use chemfallow, eliminating land cultivation and relying solely on herbicides. Others replace one or more operations by fallow with the use of a herbicide. For example, you can control winter annual vitum using 2.4-D in late autumn or early spring. This allows you to postpone the first cultivation during fallow until the end of May or early June. Also, rotary gates can control the cevel without disturbing the residue cover if they are set to minimal activity. If you decide to cultivate, maintain the speed by cultivating 8 km/h (5 miles/hour) or less. When cultivating, use wide knives or low crown sweeps to keep the residue cover. To leave more remove the mounted gates from the tiller. Avoid growing summerfallow after the end of August. The remaining standing pled will not draw too much moisture from the soil, but will help trap snow and reduce wind erosion in winter. Avoid the manitering of eroded hills; just pick up your tool when you cross the hills. Finally, try to avoid summerfallowing on rapeseed stubble. It decomposes easily and therefore provides only limited protection from erosion and limited benefits for maintaining moisture. Influence of soil cultivation equipment on the cover of residues Tools % of the residual cover remaining after one pass plow 10 chisels (less than 12 inches) 50 to 70 sweeps (20-inch to 30-inch) 80 blade (more than 3 0-inch) 90 offset disc 50 tandem disc 60 gate-springatooth 65 gate-steel tooth (more than 12-inch) 95 Protection continuously chopped field Wind erosion in continuous crop systems usually results from plowing that buried most or all of the residue from the previous crop. Reducing or eliminating soil cultivation will maintain the cover of residues to control erosion with the added benefit of maintaining soil moisture. If you decide to go to the checkout, use a low rate of tilling, use tools that bury less leftovers, and avoid tilling eroded hills. Systems with reduced or zero production shall include the management of crop residues. Treatment of residues begins at harvest. Use to combine evenly spread chopped straw and husks over the entire width of the cut. Uniform spread helps reduce problems such as clogging sowing equipment and uneven crop formation. After harvesting, you may need to use oscillating gates to spread clumps of straw. A rotary or cep mower can be used in spring to mow very heavy residues or very high standing stubble. Avoid burning unchallenged crops or heavy, poorly spread straw. Burning destroys soil humus and organic carbon and leaves the soil prone to erosion. For systems with reduced and zero cultivation, crop residues shall be distributed evenly. Use high-gradient planters for direct seeding systems. Sowing into anchored stubble is often not as difficult as sowing through stubble released by cultivation. The types of openers range from those that barely disturb the soil to others that disturb the soil enough to provide some control of the weeds during sowing. Protection of irrigated fields In irrigated fields, the management of residue residues often involves burying heavy plant residues produced by high-yield crops (for example, soft wheat). This can leave these fields very susceptible to wind erosion. As with other crop production systems, the best way to control wind erosion on irrigated land is to maintain coverage of crop residues by reducing or eliminating land cultivation. If possible, cut and evenly distribute the crop residues using a combination. Make sure that the harvester mowing and squirting equipment does its job well enough to clean the seedling spring. You can also handle very heavy residues by scheduling them rotary mowers. Baling and removing heavy residues is another option if enough residues remain to protect the soil from erosion. Irrigated crops, such as sugar beets, potatoes and beans, leave a small residual cover. Special measures should be taken to prevent wind erosion in these fields. For crops that are harvested early, seed cover crops of oats or rye. The cover crop is able to grow enough before the summer to protect the soil, but in the following spring it will not pose a problem with residues. Unintentional corners of swivel irrigation fields tend to be focal points for wind erosion. Planting forage or grass on these corners will protect them from wind erosion. Forage protection of field forage fields can also be damaged by wind erosion. The biggest risk is when fields are divided by heavy discs and plows to convert them into annual crop production to control fillers and rejuvenate stalls. Direct sowing of fodder plants, cereals and oilseeds into fodder stands is the best way to reduce the risk of erosion in the conversion of fodder plants. Crops can be directly deployed to the forage rack after the stand has been killed by a herbicide. Autumn spraying, usually with glyphosate, provides a good suppression of plant forage. Research shows the same or better returns compared to the use of obsteping. Protection of pasture Excessive pasture reduces the long-term productivity of pasture and leaves the soil vulnerable to erosion. Grazing must be able to leave adequate plant cover. In general, for permanent pastures under continuous grazing, leave about 50% of the current growth for the native range and about 25% for tame pasture. Shelterbelts Field protection belts can provide additional protection against wind erosion no matter what trimming system is used. They are especially important in dry years, when low crop yields lead to insufficient coverage of residues. Field belts reduce wind speed to distances up to 30 times higher than trees. They also trap snow, increasing soil moisture to increase crop yields. This increase in yield helps to compensate for the loss of yields associated with the removal of land from crop production for the planting of shelterbelt. Field shelters reduce wind erosion and save soil moisture. To get the maximum benefit from your shelter strips, you will need to plan design and selection of species, site preparation, wasteland control for the first years, and pruning and other maintenance. You will need to choose the kind suitable for your area. New options for shelterbelt controls - such as plastic, textile or bark mulch - have reduced the effort needed to create shelter strips. Emergency wind erosion control measures can still occur, even if preventive measures are taken. Dry soil, poor snow cover, poor residual cover from low-yield crops, and persistent strong winds make controlling erosion a huge challenge. It takes just one serious wind erosion event in 20 years to negate all the careful management in recent years. Emergency checks are used for wind erosion immediately or has begun. Increasing the roughness of the surface of the field or covering the soil with straw or manure are two basic emergency measures. Increasing surface roughness Rougher surface reduces wind speed on the soil surface, making the wind less able to move soil particles. Ripping clay soil: Ripping clay soil using spikes will usually bring up non-erodable lumps to create a rough surface. If the lumps probably break down quickly, the distance between the passages should be about 5 m (15 feet). In this way, the procedure can be repeated later on an untreated strip if necessary. Ripping is an emergency measure to reduce wind erosion on clay soil. Sandy soil extract: The extract is used for sandy soils because they do not produce durable lumps. Extract the ridges of the soil and bring a firmer sub-return. It must be perpendicular to the eroding wind and should always start on the windy side of the field. Treatment of the entire field will significantly reduce erodibility. Lister shovels are mounted only on the back gang of heavy tiller. Lister shovels (33 or 38 cm (13 or 15 in)) are commonly used in the production of irrigated potatoes in southern Alberta. Correctly stated, the flat surface of the field can be changed so that the ridges are 25 to 30 cm (10 to 12 in) higher than the trough, and about 90 cm (36 in) apart. For the dump to be successful, shovels must be able to penetrate to a depth of 15 to 20 cm (6 to 8 inches). The list of sandy soils reduces wind erosion. When ripping or listing, the rate of machining should not exceed 6.4 km/h (4 miles/hour). An increase in surface roughness should be done before the soil freezes. Even frozen soil can erode; it can blow away the layer at a time when only a few upper millimeters are thawed and dry. Covering soil with manure or straw manure is preferred as soil cover, as it also increases soil fertility and tilth. Depending on the soil, a speed of 30 to 60 tonnes/ha (15 to 30 tonnes/c) is required to protect the soil. Spread the manure evenly and do not work with it into the ground. The spread of straw at 2 to 4 tonnes/ha (1 to 2 tonnes/ac) also protects the eroding soil. Straw should be crushed, not used in small packages. It may be necessary to stick it out with the tool disc to anchor it against the wind. Apply straw before freezing, because anchoring the straw to the ground is very difficult once the soil is frozen. Summary Wind erosion has plagued prairie agriculture for many decades. However, with today's agricultural facilities and procedures, wind erosion control can easily be part of your crop and pasture management systems. To control wind erosion: maintain a vegetative cover, either growing plants or plant residues, reduce cultivated fallow, reduce or eliminate tillage of the soil, if you do, choose tillage of the soil, which buries fewer residues and reduces the rate of cultivation of soil, plants and maintain field shelter strips. to avoid excessive paste, these measures also benefit the crop and pasture production system by maintaining soil moisture for better Modern equipment allows sowing into standing stubble. Modern equipment for harvesting and handling residues allows farmers to effectively manage crop residues. Under most conditions, good cover of crop residues can be maintained without hindering subsequent plant activities or crop growth. Today's selection of planting equipment offers excellent clearance of residues, due diligence and packaging, so you can grow crops through standing stubble and spread residues. However, drought and persistent strong winds can still cause wind erosion, even if preventive measures are applied. Use emergency checks if there is a risk of wind erosion or in its early stages. Emergency checks include tearing the soil to make lumps, extract to change the shape of the soil surface, and covering the soil with manure or straw. Wind erosion is a serious problem that threatens the long-term productivity of prairie soils. With the help of appropriate conservation farming techniques, you can reduce wind erosion in most conditions. Soil is a precious resource that needs your protection. Control wind erosion using a cover of crop residues and shelter. For more information contact your local Alberta Agriculture, Food and Rural Development or Agriculture and Agri-Food Canada Authority for more information and other publications on controlling wind erosion direct sowing, shelterbelts the rest of the management and grazing management. Information was provided by the late John Timmermans and Frank Larney. For more information, contact Dale Horapko. Source: Agdex 572-2. 572-2.